LOCAL SELF-GOVERNMENT.

The HON. MR. MACAULAY introduced the Bill to extend the system of Local Self-Government in Bengal. He said that he did not propose at this stage to enter upon any discussion of the details of the measure His object for departing from the usual course was that his colleagues might have an opportunity of making themselves fully acquainted with the provisions of the Bill before they were called upon to discuss it. It had been represented to him by more than one member of the Council that it would be desirable that they should have some further time for this purpose, and he would therefore, with the permission of the President, reserve his remarks until the motion for referring the Bill to a Select Committee came before the next meeting of the Council. He might, however, be permitted to say one or two words with reference to the delay which had taken place in the preparation of the Bill. The Council were aware that the drafting of such a measure as this in the middle of the Session, when Select Committees and the Secretary were cosntantly engaged upon other Bills, was a work of no ordinary difficulty. But the difficulty had in this case been much enhanced by the sudden and serious illness of the Secretary Mr. Reily, who, he regretted to say, had been compelled to take leave to Europe. They had, however, been fortunate in obtaining the assistance of his learned friend Mr. Macgregor, and he deemed it right to inform the Council that it was mainly owing to Mr. Macgregor's ability and the untiring industry with which he had devoted himself to this task that there had not been still further delay in bringing the Bill before the Council. MR. MACAULAY had also to express his acknowledgments to his Hon. friend Mr. Reynolds, who had been good enough to assist him with his great knowledge and experience in revising and settling the terms of the Bill. He then moved that the Bill be read in Council.

HIS HONOR the PRESIDENT said that he thought it was in accordance with the general wish of the Council that any discussion on this measure should be deferred for another week. Personally he was quite willing to meet those wishes, not only on account of the length of the Bill, but on account of its great importance. Therefore he thought it would be better on all grounds that the Council should reserve any remarks they wished to make till the next week when the motion would be put to the Council to refer the Bill to a Select Committee.

The motion was put and agreed to

The Council was adjourned to Saturday, the 3rd March 1883.

DOCKS AT DIAMOND HARBOUR.

No. 75.

Dated 23rd February 1883.

THE following papers on the subject of the proposal to construct Docks at Diamond Harbour are published for general information.

By order of the Lieutenant-Governor of Bengal,

S. T. TREVOR, *Colonel*, R.E.,

Joint-Secretary to the Government of Bengal,

P. W. Dept.

No. 615MPI, dated Calcutta, the 23rd February 1883.

From—COLONEL S. T. TREVOR, R.E., Joint-Secretary to the Government of Bengal, Public Works Department,

To—The Secretary to the Government of India, Public Works Department.

I AM directed to submit, for the information of the Government of India, the report of the Committee appointed in December 1881 to consider the question of constructing docks at Diamond Harbour, together with an office note on the report by the Joint-Secretary in this Department, and a Minute by His Honor the Lieutenant-Governor.

2. I am to state that, for the reasons given in His Honor's Minute, the Port Commissioners have been requested to institute an enquiry in communication with the Chamber of Commerce, and to submit a report as to the measures which it is possible to take for the extension of the present accommodation in the port, and the cost at which any changes which may be recommended can be carried out. His Honor deems it right that some conclusion should be arrived at on this point, upon which an issue has been directly raised by the merchants of Calcutta, before any action is taken upon the proposals for constructing docks at Diamond Harbour.

3. As regards the alternative scheme for the construction of docks in the neighbourhood of Calcutta, communicating by means of a ship canal with the Mutlah river, which the Government of India will observe has been discussed in the report of the Committee, and which has strong advocates in some members of the mercantile community, Mr. Rivers Thompson is of opinion that it is unnecessary to order any further enquiry at present. This scheme has been more than once under discussion, and no serious effort has ever been made to raise the capital required for its prosecution. If, however, the Government of India deem it advisable to do so, a professional survey of this work will be ordered.

No. 616MPI, dated Calcutta, the 23rd February 1883.

From—COLONEL S. T. TREVOR, R.E., Joint-Secretary to the Government of Bengal, Public Works Department,

To—The Vice-Chairman of the Port Commissioners.

I AM directed to forward herewith, for the information of the Port Commissioners, 50 copies of the report of the Committee appointed in December 1881 to consider the question of constructing docks at Diamond Harbour, together with an office note on the report by the Joint-Secretary in this Department, and a Minute by His Honor the Lieutenant-Governor. His Honor has decided that before any further action is taken upon the proposals of the Committee, the question as to the further capabilities of the extension of the port should receive a fuller and closer investigation than has yet been attempted. I am therefore to request that the Port Commissioners will, in communication with the Chamber of Commerce, institute an enquiry, and submit a report as to the measures which it is possible to take for the extension of the present accommodation of the port, and the cost at which any changes which may be recommended can be carried out.

Minute by His Honor the Lieutenant-Governor of Bengal.

I THINK that all these papers should be published for general information before the Government can take any further steps in the matter.

The Committee, whose report is now under consideration, was appointed by the Lieutenant-Governor of Bengal, in December 1881, to examine the question of the construction of wet docks at Diamond Harbour, in view of the sanction which had then been received for a railway from Calcutta to that place. The railway referred to is now all but completed, and will be open to traffic in the course of a few weeks; and there can be little doubt that, if not at once, yet certainly with the completion of the railway bridge over the Hooghly (which will probably be finished in 1885), the advantages of a subsidiary port at Diamond Harbour would be very great to the mercantile and shipping community, if its establishment is within the limits of a practical and profitable undertaking. By the successful completion of such a project, the difficulties and dangers to which navigation of large ships above Diamond Harbour is exposed would be removed; the cost now incurred in bringing ships up the longer distance to Calcutta would be saved, the expenses involved in loading and unloading cargoes, in portage, and other similar charges would be diminished, and great convenience would probably result to the passenger traffic from and to Calcutta. It was not, however, with reference to these future possible advantages that the question of this Diamond Harbour dock scheme was mainly revived. The much more serious consideration has pressed itself upon our attention, that with the rapid development of railways converging on Calcutta, and the vast strides which the trade of the port has made within the last ten years, the existing accommodation for ships in the port of Calcutta is insufficient to meet the requirements of the increasing traffic. As to this fact, there appears from the 18th paragraph of the Committee's report to be no difference of opinion among the members of the Committee, who agree "that a large increase in the accommodation of the port of Calcutta will soon be an urgent necessity." The unanimity, however, begins and ends at this point; for on the further question as to the best means for meeting this difficulty, though a strong majority of the Committee are favourable to the Diamond Harbour project "as the most practicable scheme which has yet been proposed, and the one that offers the best prospect of financial success," it is found that the merchants of Calcutta, presumably those who are most nearly interested in its effectual solution, deprecate any measure which will tend to remove the shipping from the present limits of the port. This view, though not universally accepted by the mercantile community, is based on the opinion "that the transfer of a part of the business of the port to Diamond Harbour, or to any similar locality, would be attended with much inconvenience and expense. It would be necessary, it is urged, to keep up double establishments, and to rent a double set of warehouses: matters of importance will either have to be settled by subordinates, who will be unfit to deal with them, or will have to be delayed for the decision of a principal, who will be forty or fifty miles away. The value of the property of the Port Commissioners, and of the owners of godowns in Calcutta, will be seriously depreciated. The example of Port Canning is sufficient to show the danger of attempting to divert trade into new channels."

The objection thus generally taken is further strengthened by the dissents which have been recorded by two eminent members of the Committee, representing the mercantile interests of Calcutta, who consider that there is room within the limits of the port for much further expansion of improvements, and agree with Mr. Duff Bruce, the Vice-Chairman of the Port Commissioners, that the present accommodation can be considerably increased. Mr. Keswick, in his note of dissent, adds that his "enquiries lead him to believe that it is possible for the Port Commissioners to acquire land on both sides of the river from Garden Reach downward, sufficient to double the accommodation of the port, and provide sufficient warehouse and jetty-room;" and Mr. G. H. Morrison, speaking with the authority of President of the Chamber of Commerce, records, among other objections to the proposal, the opinion that the docks at Diamond Harbour, if successful, would gravely prejudice Calcutta as a centre of trade, and probably ultimately destroy it as a port (p. 28).*

* See page 293.

Now, in considering the measures which have been adopted during the last twelve years to extend the facilities within the port, it is desirable to notice the great improvements which have been made under the Port Trust. Twelve years ago (I am quoting from the report of the Committee on the Diamond Harbour Dock project) "there were no jetties, wharves, warehouses, or appliances available generally for loading or unloading vessels in the port of Calcutta. Vessels were moored in the river and cargoes were discharged and taken in by means of cargo-boats. The Port Trust was established in 1870, and since then great facilities have been provided by the construction of jetties supplied with suitable good-sheds, hydraulic and steam-cranes, and a line of tramway in rear of the jetties in connection with the Eastern Bengal Railway." During the period in question the number of jetties has been doubled. There are now eight of them, and the extent and growth of their advantages may be gathered from the fact that, while the number of vessels accommodated by the jetties was in 1869-70 only 75, in 1880-81 there were 193. Again, whereas in 1871-72 (the earliest date for which figures are available) the total jetty receipts for imports and exports came to Rs. 3,63,145; in 1880-81 they amounted to Rs. 7,14,189. The report goes on to say that "these jetties and their appliances for loading and unloading are all of the latest approved types of construction, and admirable in all respects. If there were room in the port for extending them from time to time to meet the growing trade, it seems probable that such a course would be adopted in preference to taking up new ground for docks at a distance from Calcutta, and that merchants would be content to trust, at all events till the growing size of vessels exceeded the draft available in the river, to the acknowledged skill of the Pilot Service to overcome the dangers of the navigation of the Hooghly. But the jetty accommodation is not really sufficient even for the existing trade of the port, and the evidence we have collected shows that, *although room might be found for some extension, yet it is very doubtful whether the space available in port could be made adequate at any reasonable cost to meet the increased trade that will be brought to Calcutta by the opening of the railway bridge over the Hooghly, and the extension of railways in Bengal.*"

The part which I have italicised in the above quotation raises an issue as to facts, regarding which the dissenting members of the Committee at all events are opposed to the majority of the Committee; and it is due, I think, to the influential body who take this objection, and who after all are the most interested in the settlement of the question, that the matter as to the further capabilities of the extension of the port should receive a fuller and closer investigation than has yet been attempted. It is quite true, as Colonel Trevor points out, that by merely expanding existing appliances, we do not touch the great drawbacks of the port, and the main causes of its expensiveness, which lie in the 120 miles of extremely difficult river navigation, involving heavy charges in pilotage and detention. The Diamond Harbour scheme, if established, would at once diminish these and other evils in the present system. On the other hand, the proposals of the Committee subvert all the present business arrangements of the port, and I am quite certain that the Government could not commit itself to any project involving an outlay of a million-and-a-half of money without a detailed discussion of the alternative suggested of extending the accommodation in the present limits of the port. It is scarcely necessary for me, upon this view of the case, to state at length my own views; but I confess that I entertain very strong doubts whether any possible extra facilities within port limits will afford more than a very temporary relief. The future developments of trade which the continual progress of railways encourages are incalculable; and when the bridge over the Hooghly is finished, and direct communications with Calcutta have been established from the producing districts of the North-Western Provinces, and the tracts of country served by the Northern Bengal, the Central Bengal, and the contemplated line from Seetarampore to the Central Provinces, with their connected branches, the space at present at the disposal of the Port Commissioners seems to me to be utterly inadequate. I leave out of question the lines which are under survey and construction in the Dacca and Mymensingh districts, and the lines projected under the same general system towards Tipperah, Cachar and Chittagong, because all the produce and trade of those regions seems, upon the

most cursory view of the map, to be likely to seek its most natural outlet from the port of Chittagong. But even with such relief as this may give, I doubt whether any economy of space, or any extension of jetties and appliances within present port limits, will meet its requirements a few years hence. As the issue, however, has been directly raised by the merchants of Calcutta, it is right that it should be settled before any action is taken upon the Diamond Harbour proposals.

I propose, therefore, to publish the papers with this Minute and the Note recorded by Colonel S. T. Trevor on the 4th August last. I would ask the Port Commissioners, in communication with the Chamber of Commerce, to institute an enquiry as to the measures possible for extending the present accommodation of the port, and the cost at which such changes could be effected. I limit myself to this point, because the Mutlah Canal scheme, which has strong advocates in some members of the mercantile community, has more than once been under discussion, and no serious effort has ever been made to raise the capital required for its prosecution. In forwarding, however, the papers to the Government of India, and explaining the action we have taken, it may be stated that, if they deem it advisable, a professional survey of this work would be undertaken. Our object is to discover a remedy "for the present congestion;" and if every scheme which is started has to be investigated in all its details, we shall have to postpone practical action to an indefinite period. If the extension of the existing accommodation of the port fails us, I see no better hope for relief than in the establishment of a subsidiary port at Diamond Harbour in connection with the railway to that place which is about to be opened.

RIVERS THOMPSON.

17*th February* 1883.

Office Note by COLONEL S. T. TREVOR, R.E., *Joint-Secretary and Chief Engineer, Bengal, Public Works Department, on the Report of the Committee on Docks at Diamond Harbour.*

MR. ROBERT STEEL, who was a member of the Committee till he went to England, has returned, and at my request has kindly furnished me with a note of his opinion, which I put up with this. Of the two alternative projects—docks at Diamond Harbour or canal to the Mutlah—he prefers the latter, even if it should cost twice as much as the former. But he thinks both schemes premature, and would prefer to see an attempt made to extend the existing accommodation of the port. He would move the bridge higher up the river, and extend the jetties in that direction first, and afterwards in the other direction along the *maidan* frontage. He would go to the length of removing Fort William's off, if it presented any obstacle to the extension of the port. This idea of sweeping away Fort William, if necessary, to make room for the port, seems a little startling at first, but I remember it was suggested long ago—I believe by Sir William Mansfield, when he was Commander-in-Chief.

2. Mr. Keswick is also of opinion that the accommodation in the port may be doubled within the existing limits, and proposes that steps should be taken to ascertain this definitely before proceeding with any scheme for docks elsewhere.

3. Mr. Morrison's view of these proposals for increasing the accommodation for shipping without leaving the present limits of the port, is that "they deserve careful consideration, but are open to the serious objection that they leave untouched the delays and dangers of the Hooghly." He much prefers the Mutlah Canal scheme to that of docks at Diamond Harbour, and has recorded his arguments in favour of the former and against the latter, which will be found at page 28* of the report, and page vi of the appendix†.

4. In the *Englishman* of the 2nd August is a report of what is said by Mr. Miller, as President of the Chamber of Commerce, regarding the project for docks at Diamond Harbour. He spoke as follows:—"The experiment would unsettle our trade and add to the current expenses of working it. In this view there would appear to be general agreement amongst merchants: but the proposal is still in its infancy; and remembering, as many

* Page 293. † Page 301.

here must, the strong opposition which existed to the work of the Port Commissioners on the first establishment of that body, I would venture to think we may prudently await a further development of the views of the professional advisers of Government before pronouncing definitely on it, or actively opposing the proposal that has been suggested. It is possible that a wet-dock at Diamond Harbour might prove convenient for salt ships to discharge, and for ships and steamers to load cargoes of jute and seed and wheat; and if the undertaking could be commenced on a small scale and allowed to grow with the development of trade, it is conceivable that it may prove the best remedy for our present congestion. It is still in embryo, and in view of the great increase that is yearly being made in the size and capacity of steamers, and of the difficulty of navigating them up to Calcutta, I do not think we should condemn this proposal too hastily. Still it appears to me that it would be better to make the most of what we have got before venturing on these gigantic engineering feats, and I hope the mercantile community will be made aware, before it is too late, of the decision of Government, when one is arrived at, and again have an opportunity of forming an opinion."

5. These views may, I think, be taken to represent the opinion of the mercantile community generally, and they amount to this, that there is a strong reluctance to any separation or removal of the port from the neighbourhood of the merchants' offices in Calcutta. In deference to this opinion, I think the Port Commissioners should be asked to submit a full and detailed report and estimate, showing exactly what can be done to increase the accommodation within the limits of the port, what it will cost, and how far it will meet the altered circumstances of the traffic when all the railways are centred in Calcutta.

6. But if we are to be content to go on as we are, and merely expand existing arrangements, there can be no doubt that we shall never succeed in making Calcutta a cheaper port; and that is perhaps the thing most to be desired. In much of the produce exported, jute and wheat for instance, the margin of profit is very small, and the very existence of the trade depends on the cost at which such produce can be delivered at the ship's side, and on the charges for freight. The existing arrangements of the port, under which it is impossible to deliver produce at the ship's side otherwise than by the employment of intermediate agencies, and after much handling and carting and boating, are about as expensive as can well be imagined. The port itself is approached by 120 miles of extremely difficult river navigation, which involves a very heavy expense in pilotage and detention. These are the grand drawbacks of the port and the main causes of its expensiveness. By merely expanding existing appliances we do not touch them. We cannot hope to get a harbour like Bombay on the sea coast, but still we can do something to mitigate the present disadvantages. We can reduce the detentions and dangers of the river navigation by half if we build docks at Diamond Harbour, so as to enable ships to terminate their voyage there. We can extend the railway right into the docks, and build proper warehouses, with suitable appliances for lifting and handling goods on the railway, so that every possible facility and enconomy can be afforded in the treatment of goods up to the point of shipment. In this way, and in this way only, it appears to me, can we relieve trade of the burden of intermediate agencies, of the unnecessary expenses of cartage and boat-hire, and of such charges as may be attributable to the time and money spent by ships in navigating the Hooghly. The expense thrown, per contra, on trade by the termination of the voyage at Diamond Harbour is the extra cost of carriage of goods by rail to that point, and this the majority of the Committee think will be nothing in the case of goods booked through from up-country, and about one rupee a ton for goods booked to and from Calcutta.

7. In calculating the saving to ships and steamers by terminating the voyage at Diamond Harbour, the Committee reduced the amount to an extremely low figure. The calculations are given in pargraphs 42 to 46 of the report, and it will be instructive to compare them with those given by Mr. Morrison at page ix of the appendix.* It was at his instance that the Committee cut down their estimate and produced a resultant saving of Rs. 520 only for a steamer and Rs. 2,479 for a sailing ship. But for the purposes of

* Page 304.

his own argument in support of the Mutlah Canal scheme he makes the saving to be—

	Rs.
For a Coasting steamer	625
,, Canal steamer	2,230
,, Sailing ship	6,250

One omission in the Committee's estimate should be noticed. At the end of paragraph 41 it is stated that the dock charges of 14½ annas per register ton would cover all dock dues, wharfage, landing charges, &c., excluding only crane-hire and warehouse rent. But in paragraph 42, where the estimate is given of the cost of bringing a steamer to Calcutta, only "jetty charges," amounting to Rs. 385, are entered, and the "landing charges," &c., payable for the use of the jetties and which are much the heaviest, are omitted, although in the case of the vessels using the Diamond Harbour dock the average charge of 14½ annas per ton includes such charges. It should be observed that in the table given at page 12 of the report, it is shown that the Port Commissioners actually realized an income of Rs. 7,14,189 for the use of the jetties from 193 vessels, or an average of Rs. 3,700 per vessel; whereas in the calculation given in paragraph 41, the Committee estimate that an income but slightly larger, Rs. 7,50,000, will be sufficient to make the docks a remunerative undertaking and that it can be realized from 468 vessels—an average of Rs. 1,600 per vessel. There is here, therefore, a saving of Rs. 2,100, for which no allowance has been made in the Committee's estimate. The Committee's report just touches on this point in paragraph 46, but in the absence of figures giving the precise incidence of the charges in each case, we could not go into the matter more fully. I think there is no doubt, however, that the Committee's estimate of savings errs too much on the side of safety, and that Mr. Morrison is probably more nearly correct.

8. His estimate again at page x of the appendix* gives almost fabulous figures for the savings in boat and cartage expenses. He gives these figures as the anticipated results of the Mutlah Canal scheme which he is advocating; but they are the supposed results simply of berthing ships in properly constructed and furnished docks, instead of in the open river as at present. They are therefore applicable with as much force to the Diamond Harbour scheme as to that of the Mutlah Canal. I should say that they apply with much greater force, for (1) the Diamond Harbour scheme will involve only half the capital expenditure of the other, and therefore the charges so far as providing for interest is concerned will be proportionately less; (2) it will reduce the distance between Calcutta and the sea to about half what it is now, and the saving due to this is an absolutely calculable quantity; whereas in the case of the Mutlah Canal, there is no reduction of distance, and although the navigation is assumed to be less dangerous, it will probably not be less expensive or dilatory than that of the Hooghly. There would be two sets of pilots—one for the river up to the entrance of the canal and one for the canal itself, and the navigation of the latter will unavoidably be slow. The expense to sailing ships will certainly be much greater in the case of the canal than in that of Diamond Harbour, on account of the towage: they must be towed in the canal, but they would get up to Diamond Harbour without it. There would be delay in warping them through the locks for they could not be towed in for want of space. Then, again, there are the important considerations given in paragraph 62 of the report. On the whole, it seems to me that all the advantages of economy, which Mr. Morrison claims for the docks of the Mutlah Canal can be much more reasonably claimed for the Diamond Harbour docks; while as to the question of men's business being destroyed, or their interests assailed, the whole discussion seems to me to turn on the question of providing for an inevitable *increase* of business, not on its destruction. There may, indeed there must, be changes in the methods of carrying on business to provide for such increase, but I cannot see how any idea of destruction can arise. But supposing Mr. Morrison's figures to be accepted for the sake of argument, and that they are as applicable to Diamond Harbour as to the Mutlah Canal, we may form some estimate from them how greatly the savings resulting from the use of docks would exceed the extra carriage from Calcutta to Diamond Harbour. The

* Page 304.

savings he estimates at Rs. 81,25,750, while the extra carriage on the total tonnage which entered the port would, at one rupee per ton, be Rs. 12,20,546.

9. But the main argument to my mind in favour of Diamond Harbour is that which I have given in paragraph 6 above. Leaving out of consideration ordinary Calcutta assorted cargoes, which it may probably always be preferable to bring up to Calcutta, it is clear from Mr. Leslie's note that there is reason to believe that a very large export trade in grain, coal, &c., might be created if only the appliances existed for delivering such cargoes cheaply into ships' holds. Such trade is strangled by the expenses of shipment as the business of the port is now conducted; and the prosperity of Bengal, the wealth of the agricultural population, and its consequent ability to cope with famines when they occur, depend enormously on the fostering of such trade.

10. The uncertainty of the permanence of the channels of the Hooghly below Diamond Harbour is a point which Mr. Morrison regards as almost fatal to the proposal to build docks there. But as he himself remarks, the Hooghly has been navigated for the last hundred years, and why not another hundred? Those who recommend the expansion of the existing accommodation at Calcutta, evidently are not deterred by any fear of the river closing. At any rate, we know all that is to be known of the Hooghly channels, but our experience of the Mutlah is almost nothing. There appears to me to be less wisdom in sinking three millions on a speculative transfer of the port to a new and almost unknown river than in spending a million and a half in providing docks on a river which already forms the port of Calcutta, and of which we know the worst.

11. The opposition of the mercantile community throws a difficulty in the way of proceeding with the dock scheme. I think not only should we get a report and estimate from the Port Commissioners to set at rest the question of the possibility of extending the present port, but we should also appoint some one to investigate the scheme for the canal to the Mutlah, and frame as correct an estimate as possible of its cost. In the meantime I think the Committee's report should be made public.

The 4th August 1882. S. T. TREVOR.

REPORT OF THE COMMITTEE ON DOCKS AT DIAMOND HARBOUR.

PRESIDENT:

HON'BLE H. J. REYNOLDS, C.S.,
Chairman of the Commissioners for making Improvements in the Port of Calcutta.

MEMBERS:

H. C. LEVINGE, ESQ., C.E.,
Secretary to the Government of Bengal, Public Works Department.

COLONEL S. T. TREVOR, R.E.,
Joint-Secretary to the Government of Bengal, Public Works Department.

BRADFORD LESLIE, ESQ., C.E.,
Agent to the East Indian Railway Co.

ROBERT STEEL, ESQ.,
Firm of Robert Steel & Co. of Calcutta.

G. H. MORRISON, ESQ.,
Firm of Turner, Morrison & Co. of Calcutta.

C. WAWN, ESQ. C.E.,
Special Engineer appointed to the Committee by the Secretary of State.

SECRETARY:

C. W. ODLING, ESQ., C.E.,
Executive Engineer, Public Works Department, Irrigation Branch.

After the second meeting of the Committee, Mr. Steel left Calcutta and was replaced by

J. J. J. KESWICK, ESQ.,
Firm of Jardine, Skinner & Co.

1. The Committee held meetings at the office of the Port Commissioners on the following dates:—10th January, 31st January, 24th March, 20th April, and 1st May 1882. They visited Diamond Harbour on the 25th January. All the members were present at every meeting.

2. Mr. Wawn arrived in Calcutta on the 12th December 1881, and proceeded on the 15th of the same month to Diamond Harbour to make his preliminary examination of the site of the proposed docks. He subsequently visited Diamond Harbour on the 25th January, the 25th February, the 2nd March, and the 26th April. In the meantime he has been engaged in the preparation of the designs, which are submitted with this report and explained in his letter of the 4th of March.

3. Under Mr. Wawn's directions, trial-wells and borings were sunk by Mr. White, Assistant Engineer, Diamond Harbour Railway. A well was got down dry to about 25 feet below the surface of the ground, or about 10 feet below low tide. At about this level water was first encountered, and at about 28 feet below the surface the earth fell from behind the timber backing, and the well was abandoned. A brick well is at present being sunk. Borings to a depth of 82 feet have been made in two places, the general result shewing a mixture of silt and sand in varying proportions. In boring No. 1, at a depth of between 40 feet and 50 feet from the surface, where the proportion of sand was greatest, a considerable quantity of water also appeared to be present with it, but to what extent the water is likely to give trouble cannot be satisfactorily gauged until a well has been sunk through it. In boring No. 2 very little water was observed. The latest information on this subject will be found in Mr. Wawn's letter in the appendix,* page v.

Proceedings of Committee.

4. At the first meeting of the Committee it was resolved, in order to obtain general information as a guide to more particular enquiries, that the Committee should draw up and circulate amongst merchants, ship-owners, pilots, &c., a series of questions relating to the navigation of the river, size and expenses of vessels, general commercial facilities, &c.

5. Questions suggested by different members of the Committee after the first meeting having been collected, arranged, and printed, another meeting was held on the 31st January to consider them. They were then, as modified in Committee, corrected and issued to about 100 gentlemen, who, it was supposed, would be able to afford information, including the Port Commissioners, the Chamber of Commerce, insurance companies, &c., and a note explaining generally the scheme, as suggested by the Special Engineer, was circulated with the questions (see appendix, page xi).

Messrs. R. Steel & Co.
" Hoare, Miller & Co.
" Mackinnon, Mackenzie & Co.
" George Henderson & Co.
" Gladstone, Wyllie & Co.
" Ralli Brothers.
" Prankissen Law & Co.
" Jardine, Skinner & Co.
D. Scott, Esq., Vice-Chairman, Port Commissioners.
Captain Yates, Harbour Master.
Lieutenant Petley, R.N., River Surveyor.
" Stiffe, I.N., Port Officer.
S. R. Elson, Esq., Master Pilot.
A. J. Milner, Esq., Branch Pilot.
G. H. Simmons, Esq., Secretary, Port Commissioners.
W. H. Grimley, Esq., Collector of Customs.
C. J. Wilkinson, Esq., Superintendent, P. & O. Co.
Captain G. S. Thompson.
F. Prestage, Esq., Agent, Eastern Bengal Railway.
Messrs. Bird & Co., Managing Agents, Burrakur Colliery.
R. M. Daly, Esq., Branch Pilot.
Messrs. Duncan Brothers.
" Apcar & Co.
A. B. Inglis, Esq.
Messrs. Gillanders, Arbuthnot & Co.
Chamber of Commerce.
J. R. Wells, Esq., Branch Pilot.

* Captain A. D. Taylor, I.N.
Lieutenant Stiffe, I.N.
C. J. Wilkinson, Esq., Superintendent, P. & O. Co.
Messrs. Hoare, Miller & Co.
" Ralli Brothers.
W. H. Grimley, Esq.
Messrs. Gladstone, Wyllie & Co.
R. M. Daly, Esq., Branch Pilot.
Messrs. Gillanders, Arbuthnot & Co.
S. R. Elson, Esq., Master Pilot.
W. Duff Bruce, Esq.
The Port Commissioners enclosing a letter from J. R. Wells, Esq., Branch Pilot.

6. A sufficient number of replies having been received, a meeting of the Committee was held on the 24th March to consider them, and to deduce from the evidence thus obtained the information to be set forth in the report. The names of the gentlemen who have favoured the Committee with replies are given in the margin, and their replies are printed in full in the appendix, pages xi to xliv. Besides replies to the Committee's questions, the gentlemen named on the margin* have also addressed letters to the Committee explaining their views more fully and generally: these are printed in the appendix, pages xlix to lvii.

7. At the meeting of the 24th March, the Committee considered also Mr. Wawn's letter of the 4th idem, printed at pages i to iv of the appendix IV,† and examined Captain Yates, Harbour Master of Calcutta, more fully as to the replies given by him to the printed questions.

* Page 300. † Pages 296–299.

Review of previous schemes for improving the port.

8. Before proceeding to consider the opinions which have been collected on the scheme of docks now proposed to be constructed at Diamond Harbour, the Committee deem it advisable to review briefly the projects which have been previously suggested with a view to improve the port of Calcutta. In a letter from the Bengal Chamber of Commerce, dated the 29th December 1858, reference is made to a proposal, dating so far back as 1824, for constructing wet docks in the neighbourhood of Calcutta; and in page 31, volume XXI of the Proceedings of the Institution of Civil Engineers, it is stated that in 1831 a survey was made by order of Government with a view to the excavation of a canal from Calcutta to the head of the Mutlah. This proposal for a canal was revived at various times, but eventually the matter was for the time decided by the construction of the Calcutta and South-Eastern Railway in its place.

9. In 1843 the Government of Bengal, in reviewing the proceedings of a Committee appointed to investigate the circumstances attending the loss of certain Government vessels during the hurricane of 1842, observed that the damage was chiefly due to the crowded state of the port, and pointed to the necessity of constructing wet docks with a view of preventing the occurrence of similar calamities in future. A Committee, with Lieutenant-Colonel Forbes, Bengal Engineers, as President, was appointed in May 1844 for the purpose of enquiring into, and reporting upon, the expediency of constructing wet docks capable of receiving the whole shipping of the port of Calcutta. The Committee reported strongly in favour of wet docks being constructed, and indicated the vicinity of Kidderpore as the one in most respects best adapted for the purpose. They recommended that the docks should be made of sufficient size to accommodate 200 vessels of an average burden of 400 tons, and estimated their cost at 50 lakhs of rupees. In 1847 an endeavour was made to float a company with a capital of one million sterling for constructing a line of railway to Diamond Harbour with warehouses and wet docks there. The project fell through chiefly owing to the impossibility of raising the capital without a Government guarantee of a certain minimum rate of interest which was refused, but the doubt then existing as to the feasibility of introducing railways into India had also a share in this result.

10. The Chamber of Commerce, between 1858 and 1864, several times represented the inadequacy of the appliances of the port for the increasing number of ships frequenting it. In the letter dated 29th December 1858, before referred to, the Committee of the Chamber of Commerce state: "The time has now arrived when nothing less than the absolute possession of wet dock accommodation will satisfy the increasing requirements of the extending commerce of Bengal;" and in a subsequent letter dated the 27th February 1863, they recommended to the favourable consideration of Government the construction of wet docks on a plan advocated by Mr. F. Prestage, then Chief Engineer of the Eastern Bengal Railway Company. In 1864 definite proposals for wet docks were laid before Government by Mr. Power of the East Indian Railway Company, and by Mr. Leith, Chairman of the Eastern Bengal Railway Company, representing respectively the Calcutta Victoria Dock Company, Limited, and the Calcutta Wet Docks and Wharves Company, Limited. Late in that year a Committee was appointed to consider this subject in connection with the proposed Hooghly bridge and the junction of the East Indian and Eastern Bengal Railway Companies. The practical result of the report of this Committee was the creation of the Catcutta Port Trust, which has to a very large extent met the wants of the port up to the present time.

11. The improvement of the river itself has not escaped attention. In 1863 an attempt was made to improve some of the channels by means of a toothed roller, which was on the whole considered successful, and the subject was considered of such importance that Mr. Leonard, C.E., was deputed to visit the principal European rivers in the hope that some of the means used of training rivers in Europe or dredging apparatus used there might be adapted for the Hooghly. Mr. Leonard, supported by Sir C. Hartley, C.E., recommended

the construction of a steamer fitted with rakes for the purpose of stirring the sands in the shoaler parts of the river and the construction of spurs at Moyapore. A steamer, the *Agitator*, was procured from England and commenced working in 1867. Although frequently laid up for repairs, she appears, on the whole, to have been of service. Doubts, however, were expressed whether the results were commensurate with the expense of working her, and the vessel being required for other uses, she ceased to be employed on this work in November 1869, though her dredging apparatus was ordered to be preserved for use in case of any emergency arising in future.

12. As regards the Moyapore Shoals, an estimate, amounting to Rs. 2,42,000, for spur works for improving the channels there was sanctioned in February 1868; work was carried on at intervals up to June 1870; about two lakhs of rupees being expended without any decided improvement resulting. Mr. Robertson, C.E., was consulted in 1872, and recommended that a training wall should be substituted for spurs, but the Chief Engineer did not concur in this view, which was not carried out.

13. The most determined attempt, however, to meet the constantly increasing trade of Calcutta was the creation of a new port (Canning) in conjunction with the Calcutta and South-Eastern Railway. Jetties were built on the river Mutlah, and a commencement was made in the way of providing warehouses. The capital expended was very large, but for several reasons, the most potent of which was perhaps the financial crisis of 1866, the scheme was not successful. There were from the outset grave difficulties attending the attempt to open this port; the place, like all new settlements near the Sunderbuns, was unhealthy; good water for drinking purposes was not to be had; the water in the river was believed to have a prejudicial effect on the bottoms of iron ships; the river bank cut away rapidly, and one jetty erected by the Railway Company was so much injured by scour that it fell in; tug boats and other facilities were wanting, and the place got a bad name, which, added to the financial difficulties with which the Port Canning Company were then contending, led to the abandonment of a scheme which at one time was thought likely to solve all the difficulties connected with the shipping trade of Calcutta.

14. The presumed advantages of the river Mutlah over the Hooghly are, however, so great, that in 1876 the earlier project of connecting Calcutta and the Mutlah by means of a ship canal was again subjected to detailed examination. Mr. Dejoux, C.E., of the Public Works Department, after carefully investigating the whole matter, proposed a canal 30 miles in length with a width at surface of water of 250 feet and 28 feet deep. The canal was to be supplied by pumping from the Hooghly, the maximum lift being 17 feet, and to be provided with locks 600 feet by 60 feet. Its total cost was estimated at Rs. 1,54,58,344. Including interest at 4 per cent., a sinking fund of 3 per cent., and working expenses, an annual income of Rs. 16,56,788, equivalent, according to Mr. Dejoux, to 12 annas per ton *on all* shipping visiting Calcutta, would have been required to render the project financially successful. The estimated cost included four locks into the Circular canals for boat traffic, but not wet docks at Sealdah, which, it was stated, would be necessary, unless an extra width was given to the last four miles of the canal, and masonry quay walls allowed on that length. The extra cost of these two items was estimated at one million sterling, on which a return was expected from loading and unloading charges. No serious effort was made to raise capital for this work.

These various schemes, completed or only suggested, go to shew that the trade of Calcutta has for years back been struggling against recognized disadvantages.

Increase of trade.

15. But the trade of Calcutta has nevertheless made vast strides of late years. The following statement, extracted from the annual report of the Port Commissioners, gives the number of sea-going steamers and sailing ships that have annually entered the port during the last 20 years. The statement shows only the sea-going

vessels which have been brought into port by officers of the Pilot Service, and excludes all river steamers and country boats :—

Year.	Number of vessels.			Net tonnage.
	Steamers.	Sailing vessels.	Total.	
1861-62	89	803	892	668,311
1862-63	118	816	934	699,040
1863-64	173	967	1,140	933,148
1864-65	187	1,019	1,206	997,756
1865-66	201	708	909	784,703
1866-67	175	599	774	682,848
1867-68	152	732	884	804,450
1868-69	208	679	887	839,823
1869-70	204	602	806	757,208
1870-71	259	672	931	889,229
1871-72	300	655	955	985,822
1872-73	338	615	953	978,621
1873-74	429	552	981	1,002,466
1874-75	454	473	927	1,016,706
1875-76	406	508	914	1,027,733
1876-77	552	609	1,161	1,352,155
1877-78	726	646	1,372	1,592,535
1878-79	489	478	967	1,115,392
1879-80	442	454	896	1,103,013
1880-81	506	478	984	1,220,546

16. The number and tonnage of steamers from European ports *viâ* the Suez Canal are given in the following statement :—

Year.	Number.	Gross tonnage.
1871-72	87	156,583
1872-73	95	188,509
1873-74	118	266,960
1874-75	105	270,799
1875-76	145	360,586
1876-77	161	406,120
1877-78	171	417,604
1878-79	128	347,408
1879-80	136	365,578
1880-81	163	430,894

17. These statements shew that the trade of Calcutta measured by tonnage has doubled itself in the last 20 years, and that it is passing gradually from sailing vessels to steamers. In 1877 and 1878 there was an abnormal increase of shipping in the port in consequence of the Madras famine. But setting this aside, if the number of canal steamers that entered the port in 1880-81 be compared with those that entered in 1871-72, it will be seen that in ten years the number has doubled, and the tonnage increased three-fold. But on the other hand there has been a reduction in the number of sailing vessels during the same period from 655 in 1871-72 to 478 in 1880-81, although the total tonnage has remained almost the same. The net increase in tonnage in these ten years has been from 985,822 tons in 1871-72 to 1,220,546 tons in 1880-81, which is nearly 24 per cent.; and this increase has taken place while the railway system of Bengal has been in its infancy. It is only within the last five years that any advance has been made in extending railways in Bengal further than the original guaranteed lines. We have now the Northern Bengal system at work and the Tirhoot system and the Patna-Gya line. Further extensions are either actually under construction or will soon be commenced in Central Bengal, in Eastern Bengal, and in Western Bengal to connect Calcutta with the Central Provinces. The prospect thus opened out of a further rapid increase in the trade of Bengal is very clearly indicated in a

memorandum which has been furnished to us by our colleague Mr. Bradford Leslie, and which we here quote:—

If it be assumed that the trade of Bengal has nearly attained its final development, and that all further expansion of trade will be diverted to Bombay, there would be no sufficient cause for bringing the East Indian Railway across the Hooghly, or for considering the subject of docks at Diamond Harbour; but this is not the opinion of those who have studied the subject by the light of practical experience.

2. In gauging the progress due to railway enterprise, it is usual to look at the net financial result, and in the case of the older guaranteed lines this is sufficiently startling, but a truer index of their utility would be the value of goods transported. Although it is impossible to give this, the tonnage carried affords some idea of its rate of increase.

3. Owing to progressive reduction of rates the tonnage carried on nearly all the railways has increased in a much higher ratio than the net earnings.

4. The following statement exhibits separately the quantity of coal and all other goods received by rail at Howrah from the year 1871 to the year 1880 inclusive. Dividing the total period of ten years into two of five years each, and taking the average of each five years, we arrive at the average increase of tonnage in a period of five years.

EAST INDIAN RAILWAY.

Statement of Goods Traffic downwards from 1871 *to* 1880.

	Received at Howrah.	
	Coals.	Other goods.
	Tons.	Tons.
1871	185,969	192,533
1872	231,727	181,161
1873	292,873	219,733
1874	311,924	215,976
1875	293,796	295,818
	1,316,289	1,105,221
Average per year ..	263,257	221,044
1876	274,387	531,189
1877	308,484	738,273
1878	398,587	533,270
1879	389,450	543,501
1880	387,836	627,515
	1,758,744	2,973,748
Average per year ..	351,748	594,749

5. The increase on coal is 33 per cent. in five years, or at the rate of about 7 per cent. per annum, and this notwithstanding the first period includes the years 1872-73-74 when the Bengal coal trade was abnormally stimulated by the fancy price of coal in England.

6. The coal trade is at present much incommoded by the want of depôt accommodation at Howrah; but when the bridge is ready this trade will receive a great impulse, and as prejudices are overcome, and the good steaming qualities of the finer descriptions of Bengal coal are better known, a slight reduction in its cost will ensure its use by ocean steamers, especially if facilities are afforded for loading direct into bunkers at Diamond Harbour. It is indeed probable that, with the completion of the harbour at Madras, the railways there will find it more profitable to use Bengal coal than English "Patent Fuel," but arrangements would be necessary for loading screw colliers direct from the railway hoppers.

7. Comparing the average downwards goods, excluding coal, received at Howrah for the five years 1871 to 1875 inclusive with the same average from 1876 to 1881, it appears that the tonnage of the ordinary railway traffic to Howrah is increasing at the rate of over 20 per cent. per annum, and most of it is for exportation.

8. The tonnage of downwards goods (excluding coal) received at Howrah during the year 1881 was 799,468: coal amounted to 392,340 tons.

9. The official returns of the internal trade of Bengal shew that the enormous increase of railway tonnage has not caused any falling off in the boat and steamer traffic, the imports into Calcutta by all the routes of navigation shewing a satisfactory increase; the explanation being that a large proportion of the boat traffic comes from districts north of the Ganges and elsewhere not yet provided with railway communication, and the great increase of railway traffic is brought from districts remote from navigable rivers and canals.

10. Considering that the construction of the proposed Central Provinces Railway will in a few years place Calcutta within a comparatively short lead by rail of the fertile districts of Sumbulpore, Raipore, and Chattisgarh, and the enormous districts north of the Ganges that will be placed in direct communication with the port of Calcutta by the extensions of the Tirhoot State Railway to Goruckpore and Bahraitch, the increase of traffic that will result from the completion of the bridge over the Ganges at Benares, the further ramifications and development of the Northern Bengal Railway system, together with the growing traffic of Assam and Cachar, the opening of the Bengal Central Railway, and the gradual reclamation of the Sunderbuns that is certain to ensue, there is no reason to suppose that the limit of railway traffic seeking Calcutta as its natural outlet has yet been distantly approached.

11. The East Indian Railway Co. is increasing its rolling-stock, and can still further reduce its rates, and by the year 1885, when the bridge, it is hoped, will be finished, the Agent confidently expects that this railway alone will be pouring in country produce, excluding coal, at the rate of 1,250,000 tons per annum, provided facilities are afforded for its export; for experience has proved the futility of stimulating traffic by cheap transport without proper accommodation for dealing with it at destination. Already, owing to insufficient shed-room at Howrah, the railway company is compelled to unduly limit the free time for removal of consignments.

12. It may be contended that there is no advantage in providing for expansion of traffic, which, owing to foreign competition or to dullness of demand, may never be realized. The reply to this is that, with every advantage in the way of communications, India can only supply a fractional part of the requirements of the markets of the world, and that by the adoption of improvements in the transmission of her produce to market, she should be in a position to command a sale for all her surplus.

13. The conditions under which India, and Bengal in particular, compete with the other grain-exporting countries are already very favourable. The climate, assisted by artificial irrigation, produces annually two crops—the khurreef and the rubbee—or the monsoon and cold-weather crops. The former, generally speaking, supports the frugal, industrious, and teeming population, and the latter is available for exportation. Agricultural labour, both human and animal, is thus constantly employed all the year round, and does not spend half its time in unprofitable hibernation as in Russia and North America. The ryot in fact employs his capital, that is his labour, continuously instead of intermittently. Again, the export of grain and seeds is favoured by the cheapness of inland transport by rail and river, and by abundance of labour for handling goods. Another favourable circumstance is that the jute sacks required for shipment of these staples are produced locally and have a high market value at the port of destination, so that instead of heavy capital outlay for elevators, machinery, and special stock for the unsatisfactory system of dealing with the grain in bulk, there is a certain profit on the very sacks necessary for carrying the grain.

14. With all these advantages Bengal should be in a position to export produce at rates which cannot be approached by any other country in the world, but for this purpose the trade must be supervised throughout by European agency. Under the existing system, in which the trade in country produce (excepting cotton, indigo, tea, and a few other staples) is chiefly in the hands of natives, a considerable percentage of the freight paid to railways is for the carriage of dirt, and produce unfit for export, and the losses through rotten bags, exposure to the weather, and pilferage are considerable. To obviate these losses, European produce agents have established themselves at the provincial depôts, who clean and bag the grain for direct shipment. There is no doubt that the dry climate of the interior is more favourable for the storage and preparation of grain and seeds than the humid atmosphere of the tropical sea-ports, and that, for the delivery of country produce in good order at the port of destination, the shorter the time it is exposed to the damp air of Lower Bengal the better.

15. It may not be out of place to point out that a regular export of food-grains is the best insurance against famine. Where grain is grown for export, stocks are held in anticipation of improvement in the market rate, and the failure of the crops in one district can be supplemented by diverting the export produce from other districts. If this is the case, the construction of the proposed docks at Diamond Harbour, which would do more than anything else to facilitate this trade, may be regarded as to some extent a work for insurance against famine.

16. The question then arises, will the existing shipping accommodation in the port of Calcutta be sufficient to deal with the increased traffic the railway will be in a position to bring into Calcutta when the bridge is finished? The change from small timber ships to iron ships and from sailing to steam vessels, and the improvements effected by the Port Commissioners, have provided for the increase of traffic in the last ten years; but it is admitted that to provide for any further considerable increase of the export trade additional accommodation is necessary, and it is certain that unless such accommodation be provided, the advantages to be derived from the crossing of the Hooghly by the East Indian Railway will not be fully realized. How and where such additional accommodation should be provided so as to secure the best facilities to trade is the subject to be considered.

17. With the docks at Diamond Harbour entire cargoes of grain and seeds and other produce could be brought down by rail and transferred direct from the railway wagons to the ship's hold, and this service could be undertaken by the Railway Company without the necessity for any other agency.

18. The reduction of the duty on salt will have the effect of sending the Liverpool salt further up-country into districts not reached by boats, and if the Government salt depôt be transferred to docks at Diamond Harbour, the facility of loading direct into railway wagons would result in very largely transferring this traffic from boat to rail, thereby reducing the opportunities for smuggling, and giving the railway a back load for its stock.

The site of the existing golahs at Sulkea is valued at many lakhs of rupees.

19. Naturally any proposal tending to dispense with intermediate agencies will be unfavourably received by those interested, but that does not affect the question under consideration. The East Indian Railway takes delivery of heavy consignments of railway material of every description not only for its own use, but also for the Oudh and Rohilkhand and State Railways, and no difficulty or complications are experienced in doing this work at very low rates even with the present imperfect appliances. With docks at Diamond Harbour these materials could be despatched direct to destination or to a mofussil depôt where they could be economically stored until required. There is no reason why the Railway Company should not in the same manner receive general cargo ex ship and deliver it to order of consignee.

20. Assuming that the proposed site for the docks at Diamond Harbour is open to no insuperable objection from an engineering or nautical point of view, and that satisfactory arrangements can be made for running powers over intervening lines of rail, the Agent of the East Indian Railway would not hestitate to recommend their construction and incorporation as part of the undertaking.

18. In the opinion that a large increase in the accommodation of the port of Calcutta will soon be an urgent necessity, the Committee is unanimous. But when we proceed to the consideration of the question how and where such additional accommodation should be provided, so as to secure the best facilities to trade, we find that the evidence which we have collected shews a great preponderance of opinion amongst the merchants of Calcutta in favour of some scheme which will avoid the removal of the shipping from the present limits of the port. This view is, moreover, advocated by two of our colleagues. But the majority of the Committee, after a careful consideration of all the evidence in favour of the proposal to construct docks at Diamond Harbour, as well as all that has been urged against it, are of opinion that that is the most practicable scheme which has yet been proposed, and the one which offers the best prospect of financial success. We therefore proceed now to consider that scheme in detail and in the order indicated in the letter of instructions from the Government of Bengal.

19. The chief dangers to which vessels are exposed in the Hooghly are very fully described at pages vi to xiv of the appendix in the answers received to the Committee's first question. Those above Diamond Harbour may be summarized as shifting sands, narrow channels with sharp bends, eddies, and the want of good anchoring places. Owing to the volume of water passing through the narrow channels about Diamond Harbour, the risks are intensified during the freshets and particularly at spring tides. The points of greatest danger are the James and Mary and Moyapore Sands, the bad anchorage at Ninian and at Fisherman's Point, and the difficult navigation off Monekhally and Fulta Points.

Risks above Diamond Harbour.

20. The following extracts relate to the navigation above Diamond Harbour. Mr. Milner says "the Muckrapatha Sand of the James and Mary is one of the most dangerous sands in the Hooghly, and the periodical closing up of the Eastern Gut in the months of March, April, May, and June often causes very serious delay." Mr. Elson also describes how these channels open and close with the season, and says "the closing of the James and Mary takes place at that season of the year when the mean half tide level of the river is low, and consequently deep-loading vessels requiring over 22 feet have sometimes had to go to Diamond Harbour to finish loading at such time." He says further that "fortunately the James and Mary has been good of late years, so that much inconvenience has not been felt." Mr. Milner says "Ninian is a most dangerous place as an anchorage, especially in the freshets on account of the strong eddies both on the flood and ebb tides, causing a ship to become quite uncontrollable and heeling her gunwale under on a strong shear if the cable will hold," and Mr. Elson says "Ninian is a forbidden anchorage for all vessels." Mr. Elson gives the names of *ten* vessels lost within the last 20 years between the James and Mary and Fisherman's Point, and says that during this time only *sixteen* have been lost below the James and Mary, thus shewing that out of 26 wrecks in the 110 miles of river below Fisherman's Point, 10 occurred in the dangerous shoals in the short space

of eight miles between that point and the James and Mary. Fewer accidents appear to have occurred lately; for whilst Mr. Milner says that Fisherman's Point is "dangerous on spring tides and in the freshets," and that it was here that the steam ship *Queen Anne* was lost, he goes on to say that to his knowledge this is the only steamer lost here since the opening of the Suez Canal, and that it was in charge of a Junior instead of a Branch Pilot. Mr. Milner says "Moyapore Flat is a dangerous obstruction on account of its liability to sudden changes. Many ships ground here." Mr. Elson says: "Monekhally Point and the usual sand below it is, on account of the whirling eddies found off it, on the ebb tide a formidable danger to vessels passing down on the springs or in the freshets," and on the same subject Mr. Milner says "the river off Monekhally Point on spring tides in the freshets is a place that is much dreaded on account of the uncontrollable eddies, and it is undoubtedly a relief to the pilot on the way down to find himself safely pass this place. Vessels, however, seldom ground on the sand, the tendency being to run on the southern bank near the crossing mark." Mr. Milner remarks generally that "in terminating the voyage at Diamond Harbour, there would undoubtedly be much risk of accident, principally to sailing ships."

21. Other nautical gentlemen mention the same points of danger without going into details. Captain Yates says "the advantages gained by the construction of the docks would be the avoidance of eddies principally above Diamond Harbour, of the narrow navigation of the upper reaches, of anchoring in the narrow channels, which are dangerous in freshets." Captain Wilkinson speaks of the risks to "a long ship rounding Hooghly Point on a strong flood tide, or in going down the river during the freshets, when she has very often stranded at Fisherman's Point." Lieutenant Stiffe says that "to have to anchor at a place like Fisherman's Point during the freshets is highly undesirable." The following standing order to pilots is significant:—"Within three days of the full or change of the moon, no sailing vessel drawing more than 12 feet shall attempt to pass the James and Mary inward-bound on the flood tide, unless in tow of a steamer," and "vessels may not be under weigh at night between Gewankolly Temple and Fultah Point, or over the James and Marys under any circumstances."

22. And yet with all these acknowledged dangers the casualties have been comparatively few, and this must doubtless be attributed to the general efficiency of the Pilot Service, the rigid order about sailing at night, and the fact that vessels are content to wait occasionally at Calcutta for favourable opportunities for sailing.

23. From a special report of the Port Officer, dated 5th May 1881 (appendix, page xlv), it appears that, whilst the number of total losses (omitting collisions) during the last *ten* years have been *two* above Diamond Harbour and *seven* below, the number of groundings in the last three years have been *ninety-six* above Diamond Harbour and *twenty-one* below.

Risks below Diamond Harbour.

24. Many dangers to navigation exist also below Diamond Harbour in the Middle Ground Shoal, the encroachment of the Middleton Sand on to Saugor Roads, the heavy swell sometimes felt in the Gasper Channel, and shifting nature of the sands between Saugor and Kulpee. To this must be added of course a considerable portion of the risk caused by rough weather in the shallows and narrow channels of the Sandheads. There are places below Diamond Harbour with no greater depth of water than above; indeed, during the freshets, the channels above are generally the deeper of the two. The channels below Diamond Harbour, however, are generally wider and not so tortuous.

Delays above Diamond Harbour.

25. The loss of time to which vessels are subject above Diamond Harbour including both the actual time required to steam or tow 50 miles each way, and the incidental delays to which they are liable, has been variously estimated; and as it depends greatly on the season, the state of the tide, the size and speed of the particular vessel, it is difficult to arrive at more than a rough average approximation. Messrs. Geo. Henderson & Co. think the saving would be only a "few hours,

and of no practical value." Captain Wilkinson says "vessels are sometimes neaped inward-bound, and have had to wait as much as two days at Diamond Harbour." Mr. Elson says "half a day, and sometimes a day, would be gained by terminating the voyage at Diamond Harbour." Captain Yates says (ships and steamers) from four to five hours up and frequently one day down. Also, "I have known instances in the dry season of P. and O. steamers outward-bound going to Diamond Harbour two or three days before their date of sailing on account of the James and Marys shoal on falling tides. This has not occurred for some years." Mr. Daly says "ships would be saved one or two days and steamers one day at least." Messrs. Duncan Brothers say "steamers one day up and down, sailing ships two days up and down." Lieutenant Stiffe says "four hours up, one day down for large vessels, if not, six hours." Messrs. Jardine, Skinner & Co. say "half a day inwards and one day outwards. More in April, May, and June." Captain Thompson says "sailing vessel one day, steamer half a day." Messrs. Hoare, Miller & Co. say "one day up, and half a day down for a steamer." Messrs. Gladstone, Wyllie & Co. say "little more than three or four hours each way, for both ships and steamers." Mr. Grimley says that "the saving in the upward passage would be three and a half hours for a steamer and five for a sailing vessel; but a large vessel might be neaped and detained four or five days."

26. Although it appears from the report of the Port Officer, dated 5th May 1881 (appendix, page xlv), that only six vessels were actually neaped in the river during the last three years, it is well known that a large number of vessels might arrange to leave port earlier than they actually do, if they were not obliged to consider the water available in the river.

27. As a recent instance of the delays in the river may be mentioned the *Vega* drawing 23 feet 6 inches, which the Committee have ascertained left Calcutta on the morning of the 15th March 1882, and did not reach Saugor until the evening of the 17th.

28. Excepting coasting vessels, the Commitee consider that the saving of time may fairly be set down for the double passage at one day for a steamer and two for a sailing ship.

Risks at moorings in the river.

29. Vessels moored in an open river are exceptionally exposed to risk of injury; more or less serious, particularly in times of strong tides, bores, and freshets, being liable to collision with vessels which have broken from their moorings, and with other floating objects. During cyclones immense damage is done; the great cyclone in the Hooghly (1864), it is said, costing the P. & O. Company alone upwards of £100,000.

30. Vessels in any ordinary dock are exempt from many of these risks, and the Committee believe that in the docks, as designed by the Special Engineer, they will be secure also from the effects of a cyclone wave, even higher than that of 1864.

Cost of risks and delays.

31. It is difficult to fix at a money value the saving which would be effected by eliminating the various risks and delays inseparable from the passage from Diamond Harbour to Calcutta and *vice versâ*, although there can be no doubt that it does represent an appreciable amount either to the merchant, ship-owner, or insurance company, and probably more or less to each of them. Perhaps it will be the simplest way to assume that all the expenses of the voyage are to be paid, directly or indirectly by "cargo," and that the direct interest of each individual engaged in the transport of the cargo from the one point to the other will arrange itself by the ordinary course of competition.

32. The replies which the Committee have received to questions on this subject do not give the complete information which we could have wished to obtain, but the size and value of the vessels and the requirements of the different trades all vary so greatly that it is perhaps difficult to see how it could well be otherwise.

33. The value of the one day and the reduced distance gained, in the case of a steamer of 3,000 gross register, and carrying 3,700 tons of cargo, appears to be fairly represented as follows:—

	Rs.
One day's internal expenses	200
Eighteen tons of coal, say	324
Pilotage saved (having paid $\frac{8}{12}$ths up and $\frac{7}{12}$ths down) ...	411
One day's insurance, depreciation, and interest on capital, say 22 per cent on £50,000	360
Total ...	1,295
Add in the case of a passenger vessel one day's victualling, say £20	240
Grand Total ...	1,535

34. The value of the two days and the reduced distance in the case of a sailing ship of 1,600 tons register and carrying 2,400 tons of cargo may be safely stated as follows:—

	Rs.
Two days' expenses	160
Pilotage saved (as above)	372
Towage up and down	1,200
Two days' insurance, depreciation and interest on capital, say 20 per cent. on £23,000	302
	2,034

35. In addition to the towage between Diamond Harbour and Calcutta, a sailing vessel will frequently save also the cost of towage from the sea to Diamond Harbour. Mr. Milner says that "all sailing ships up to 20 feet would endeavour to sail up to Diamond Harbour if that were their destination, and even ships over that draught, if not prohibited by the regulations." And, again, "these ships at present would sail up to Diamoud Harbour were it not for the knowledge that they would have to pay nearly as much from there as from Saugor. Saving of towage to the *Cuba, Simla* class both ways probably Rs. 3,000 to Rs. 3,500." These are, however, exceptional vessels, but it appears very clear that the greater part of the money now paid for towage might be saved, if a sailing vessel could terminate her voyage at Diamond Harbour.

36. It appears to be generally conceded that there would be no appreciable reduction in the rate of insurance on ships frequenting the dock, but if the voyage were shorter, the risk would of course be reduced by one or two days as the case might be.

Size of vessels frequenting the port.

37. The annual returns of the Port Officer for 1880-81, extracts from which with diagrams are given in the appendix, pages xlv to xlviii, shew that the size of both ships and steamers frequenting the port is steadily increasing, and we have not to look far for the reason. The big ships pay best. Captain Wilkinson says "it has been sufficiently proved to the satisfaction of all ship-owners that the larger a ship is built, with reference to the trade she is employed in, the greater will be the profits in proportion to the capital expended." Messrs. Apcar & Co. say "the tendency is to increase the size of steamers owing to the less proportionate expenses of a larger vessel."

38. There appears to be a very general agreement amongst nautical men that some of the vessels which now come to Calcutta have in point of length about reached the maximum which can be safely navigated above Diamond Harbour. Below that point it is practically conceded that there need be no limit to length. Long vessels are not perhaps, strictly speaking, more *difficult* to steer than shorter ones, but they require both more space and more time to turn through a given curve. For steamers up to Calcutta 400 feet in length is considered a reasonable limit by Captain Wilkinson, Captain Thompson, Mr. Daly, Mr. Elson, and Captain Yates. Mr. Milner goes further and says 450 feet, and as a matter of fact vessels 420 feet long have come to Calcutta. Messrs. Jardine, Skinner & Co. call attention to the steamers of the Hill line.

Their extreme length is 420 feet, but their twin-screws facilitate navigation. The rapid and certain action of steam-steering gear has done much to counteract the difficulty which would otherwise have been experienced with vessels of the present length, and it is possible that without it some of them could only have been brought to Calcutta with the assistance of a tug-boat. It may be mentioned that the *Rome*, one of the last new vessels of the P. & O. Company's fleet, is 430 feet long. It must, however, be borne in mind that some reaction is manifesting itself in ship-building against extreme length. A tendency is being shewn to increased beam, and so far as this may go it will enable ships to carry more cargo without increasing either length or depth.

39. For sailing vessels, from 250 feet to 300 feet appears to be generally allowed to be the greatest length which can without risk be taken above Diamond Harbour.

Facilities within the port.

40. Till within the last 12 years there were no jetties, wharves, warehouses or appliances available generally for loading and unloading vessels in the port of Calcutta. Vessels were moored in the river and cargoes were discharged and taken in by means of cargo boats. The Port Trust was established in 1870, and since then great facilities have been provided by the construction of jetties supplied with suitable goods sheds, hydraulic and steam cranes, and a line of tramway in rear of the jetties connected with the Eastern Bengal Railway. There are now eight of these jetties, and the following statement extracted from the annual report of the Port Trust shews the extent to which they have been annually utilized since their first construction :—

PERIOD.	No. of jetties.	No. of vessels accommodated.	Registered net tonnage.	Total number of days occupied at all jetties.	Total amount contributed by vessels for use of jetties.	Average tonnage of vessels.	Average length of stay at jetties.	Average number of days each jetty was at work throughout the year.	Average amount paid by each vessel for use of jetty.	Total jetty receipts for imports and exports.	Average per vessel.
					Rs.				Rs.	Rs.	Rs.
November 1869 to October 1870.	4	75	.....	.....	.....	.....	.....	.....	.....	.....	.....
October 1870 to March 1871.	4	51	66,359	485	.....	1,301	9·3	.....	.....	.....	.....
1871-72	6	143	222,446	1,363	22,900	1,555	9·4	277	160	3,63,145	2,539
1872-73	6	160	244,536	1,433	27,305	1,653	8·9	239	170	4,05,901	2,537
1873-74	7	154	211,238	1,421	29,652	1,371	9·2	203	192	4,21,774	2,739
1874-75	7	142	209,808	1,590	32,570	1,477	11·2	227	229	4,82,143	3,398
1875-76	7	156	246,304	1,455	31,230	1,578	9·3	234	208	5,42,663	3,479
1876-77	7	192	304,218	1,958	40,505	1,584	10·2	280	204	5,95,442	3,101
1877-78	7	232	355,334	2,379	63,555	1,533	10·3	342	398	7,71,825	3,327
1878-79	7	184	294,717	1,994	83,517	1,601	10·8	285	454	6,60,106	3,588
1879-80	7	192	315,263	1,944	73,467	1,642	10·1	277	382	6,56,409	3,418
1880-81	8	193	324,187	1,982	73,762	1,680	10·2	248	382	7,14,189	3,700

These jetties and their appliances for loading and unloading are all of the latest approved types of construction, and admirable in all respects. If there were room in the port for extending them from time to time to meet the growing trade, it seems probable that such a course would be adopted in preference to taking up new ground for docks at a distance from Calcutta, and that merchants would be content to trust, at all events till the growing size of vessels exceeded the draft available in the river, to the acknowledged skill of the Pilot Service to overcome the dangers of the navigation of the Hooghly. But the jetty accommodation is not really sufficient even for the existing trade of the port, and the evidence we have collected shews that, although room might be found for some extension, yet it is very doubtful whether the space available in port could be made adequate at any reasonable cost to meet the increased trade that will be brought to Calcutta by the opening of the railway bridge over the Hooghly and the extension of railways in Bengal. On this subject we would refer to Mr. W. Duff Bruce's letter at page xlix of the appendix, than whom there is no more competent authority on any matters connected with the port of Calcutta. In this letter Mr. Bruce, after describing the extent of increase that is possible to the present jetties, proceeds to develope a scheme of docks at Chitpore connected by a ship canal with the Mutlah river. This scheme, with other proposals, will be referred to further on. But in this place the Committee wish merely to describe the nature of the appliances for loading and unloading cargo which are available in the port. The table given above shews that 193

vessels, with a net tonnage of 324,187 tons were accommodated at the jetties in 1880-81. Comparing this with the total number of vessels with their net tonnage that entered the port in the same year, we see that 791 vessels, with a net tonnage of 891,359 tons, did not or could not make use of the jetties, and must therefore have discharged and taken in cargo by means of cargo boats. Of these cargo boats there were 5,548 in the port in 1880-81. As to their charges and the extent of reliance that can be placed on them, we will here quote from Messrs. Hoare, Miller & Co.'s letter at page lv—

"Amidst the many advantages which the jetties have conferred on the trade generally, but chiefly on import trade, there has been this disadvantage, that they have interfered with the boat-owner's business. The jetties have disorganized the private discharging and loading arrangements of the port without having so far furnished a complete or perfect substitute.

"For practical purposes the jetties are sufficient for the import trade. Almost all the vessels which enter from the United Kingdom with general cargoes can be discharged rapidly at the jetties, and, even in time of extra demand for space, steamers can load their export as rapidly as they discharge their import cargo; but this only refers to general or 'Calcutta assorted' cargoes. It does not include whole cargoes outwards.

"The export cargo from Calcutta is bulkier than the import cargo. With very few exceptions every vessel that clears from Calcutta clears full. On the contrary many vessels, notably steamers, enter in ballast. Now, it seems to us that the arrangements of the port stand as if just the contrary were the case: vessels can discharge quickly, and we think cheaply, whereas for loading they mainly depend on cargo boats.

"During periods of excitement in exports, such as periodically occur, the cost of putting cargo on board vessels at moorings often becoms enormous. We have known the hire of cargo boats of 25 tons capacity, which is normally Rs. 6 per day per boat, advance to Rs. 120, and remain at from Rs. 40 to Rs. 60 for weeks together. This is as if the jetties were in times of pressure to raise their rates at will from 400 per cent. to 600 per cent. The export trade is not a steady trade. Periods of excitement occur chiefly in the bulky staples."

41. It will be evident from this that it is impossible to make any reliable estimate of the cost of loading and unloading vessels which are dependent on cargo boats; and, as has just been explained, by far the larger number of vessels are thus dependent. But the jetty charges are known, and may be included in the estimate which we now proceed to make of the present cost of bringing ships into port, unloading and loading and taking them out to sea again, compared with the like charges in the case of ships putting into docks at Diamond Harbour. It is necessary in the first place to ascertain what will be the working expenses of the dock in addition to interest on capital, and the lowest remunerative charge to be made against each ship.

Cost of bringing ships to port.

Annual charge on Dock.

	Rs.	Rs.
Interest on estimated cost, including establishment, 150 lakhs, at 4 per cent.		6,00,000
Staff—		
Dock Master	15,000	
Two assistants	15,000	
Say 200 men (at Rs. 20 per month)	48,000	
European mechanic in charge of machinery ..	6,000	
Proportion of general staff, say	12,000	
		96,000
Dredging	50,000	
Electric lighting	12,000	
Repairs, average, say	25,000	
Coal	12,000	
		99,000
		7,95,000
Deduct rent of sites let for workshops, houses, &c. ..		45,000
Net annual charge		7,50,000

Estimate of Revenue.

Vessels in dock at one time.	Vessels per annum.	Tons per annum.
Say 6 steamers (2,600 average tonnage), each remaining in dock *two* weeks or less	156	405,600
Say 36 sailing ships (1,350 average tonnage), each remaining in dock *six* weeks or less	312	421,200
Total vessels ..	468	
Total tons ..		826,800

$\frac{\text{Revenue required Rs. } 7,50,000}{\text{Total vessels } 468}$ = about Rs. 1,600 per vessel (average), or $\frac{\text{Rs. } 7,50,000}{\text{Tons } 826,850}$ = about 14½ annas per register ton, or approximately 5 annas per ton of cargo inwards and 5 annas per ton of cargo outwards. These charges are intended as an average to cover all dock dues, wharfage, landing charges, &c., and would be apportioned under different heads, but they would not include crane-hire or warehouse rent.

42. Cost of bringing to Calcutta a steamer of 2,000 tons net, 3,000 tons gross register, carrying 3,700 tons of cargo, and drawing 22 feet of water in and 24 feet out—

	Rs.	Rs.	Rs.
Inwards—			
Pilotage	470		
Lead money	16		
Port dues at 1 anna	129		
Hospital dues	129		
Harbour Master	57		
Moorings	195		
Jetty charges	385		
		1,381	
Outwards—			
Pilotage	614		
Lead money	16		
Harbour Master	57		
		687	
Stevedorage 4 annas in, 4½ annas out		1,966	
Total for Calcutta			4,034

43. Charge for use of Diamond Harbour dock by same steamer—

	Rs.	Rs.	Rs.
Dues of all kinds proportioned to 14½ annas per gross ton	2,719		
Stevedorage on above	1,966		
Pilotage both ways	672		
Leadsman	32		
Hospital dues	129		
		5,518	
Less—			
One day saved on the passage (paragraph 33)	560		
Coal saved	324		
Two days saved in dock	1,120		
		2,004	
			3,514
Difference in favour of docks			520

44. Cost of bringing to Calcutta a sailing ship 1,550 net, 1,600 tons gross register, carrying 2,400 tons of cargo, and drawing 21 feet of water in and out—

	Rs.	Rs.	Rs.
Inwards—			
Pilotage	430		
Lead money	16		
Port dues at 1 anna	95		
Hospital dues	95		
Harbour Master	57		
Mooring hire	105		
Jetty charges	350		
Towage	1,600		
		2,748	
Outwards—			
Pilotage	478		
Lead money	16		
Harbour Master	57		
Towage (average) 2½ days	1,500		
		2,051	
Stevedorage, inwards 5 annas, outwards 6 annas, say 5½ annas on 4,800 tons	...	1,575	
			6,374

45. Charge for use of Diamond Harbour Docks by same ship—

	Rs.	Rs.	Rs.
Dues of all kinds proportioned to 14½ annas per ton on 1,600 tons	1,450		
Towage into and out of dock	200		
Stevedorage	1,276		
Pilotage both ways..	566		
Leadsman	32		
Hospital dues	95		
Towage two days	1,200		
		4,819	
Less—			
Two days saved on passage (paragraph 34)	462		
Ditto in dock	462		
		924	
			3,895
Difference in favour of docks			2,479

46. In making these calculations, we have been careful to place the most moderate estimate on the saving that will result from terminating the voyage at Diamond Harbour, and what error there may be in the figures is, we are confident, on the side of safety. The calculations shew that a steamer will save Rs. 520, and a sailing ship Rs. 2,479 by the mere shortening of the voyage. We have entered the same charge for stevedorage for vessels loading at the docks as for those coming up to Calcutta, and we have done this because we are unable to make any precise estimate of the saving that will certainly result when vessels are loaded in a well-organized dock. The table on page 12 shews that the revenue derived from 193 vessels that used the jetties amounted in 1880-81 to Rs. 7,14,189, which gives an average for each vessel of Rs. 3,700. Of this amount only Rs. 382 was for the use of the jetty itself, the remainder being charges on cargo for landing, hoisting, and removal of goods. The detail

of the income and expenditure of the jetties for 1880-81 is given as follows in the Port Commissioners' administration report:—

	1880-81. Rs.
INCOME.	
Imports—	
Landing charges	4,24,062
Removal charges and warehouse rent	1,11,604
Jetty hire	73,763
Hoisting charges	35,196
Damages	298
Overtime	2 406
Mi cellaneous	5,362
Commissariat jetty hire	6,158
Total ..	6,58,849
Exports	55,340
Miscellaneous—	
Interest on Government securities for Jetty Reserve Fund ..	2,497
Ditto on ditto of Insurance Fund ..	1,476
Ditto temporary loan to Part IV	....
Miscellaneous receipts	2,407
Towing receipts of barges	2,048
Sale of silk damaged at the jetty	....
Rent of new office	2,283
Total ..	7,24 900
EXPENDITURE.	Rs.
Salaries	1,57,169
Proportion of salaries—Control	40,837
Ditto ditto— Dredger	10,033
Ditto ditto— Engineering	3,537
Proportion of municipal taxes and repairs of officers' quarters	969
Ditto ditto ditto of storeyard, workshop, and lascars' quarters..	989
Interest	1,16,645
Repairs	36,579
Working expenses	73,179
Municipal taxes	31,984
Total ..	4,71,921
Net revenue ..	2 52,979
GRAND TOTAL ..	7,24,900

47. It will be seen from this statement that the income amounted to Rs. 7,24,900, the expenditure to Rs. 4,71,021, and the net revenue to Rs. 2,52,979. The circumstances of the Port Trust necessitate the laying aside of a sinking fund for the repayment of the loans received from Government, and the realization of sufficient revenue to cover the cost of part of the new works still being carried out for the improvement of the port. In the case of the docks, it may be assumed that all construction will be charged to Capital, and that the charges levied on ships will be based on a scale only sufficient to yield a reasonable interest. Again, in the port there is a heavy expenditure under the head of Municipal Taxes, the amount shewn in the table given above being about Rs. 33,000. This expenditure would be unnecessary at Diamond Harbour. We think there can be no doubt that the business of loading and unloading, moving and warehousing goods will be conducted on a much more economical scale in docks specially arranged and organized for that purpose than is possible under present circumstances. Such comparison as we have made is only with vessels that use the jetties. The much larger number that discharge into cargo boats and suffer delays and inconveniences of which we can form no estimate have not been brought into the comparison at all. The figures shew that sailing ships will be the chief gainers by using docks at Diamond Harbour, in the mere initial saving that will result from the shorten-

ing of the voyage. But they will be still greater gainers by the saving of time in being able to discharge their cargoes into the dock warehouses at once, and take in export cargo with similar rapidity.

Objections to distance of Diamond Harbour considered.

48. We proceed now to consider the question of the distance that separates Diamond Harbour from Calcutta, and it is in connection with the effect which this distance will have on the success of the scheme that the greatest diversity of opinion exists. It is necessary to consider this question in two aspects—(1) with reference to the cost of transit for the extra distance over which goods will have to pass; and (2) with reference to the inconvenience entailed by the separation of the shipping from the mercantile offices in Calcutta.

49. As regards the first point, we believe that no appreciable increase of cost in transit will occur. The docks at Diamond Harbour would be specially useful for the export trade, and we have every reason to believe that goods from up-country would be delivered by rail at the docks at through rates, which would be very little, if at all, higher for Diamond Harbour than they would be for Calcutta. For any classes of goods which could be thus transported direct to the docks without the necessity of detention and examination in Calcutta, there would be an immense gain, for they would be delivered from the railway wagons into the ship's hold, and all intermediate charges now incurred in the handling and conveying of goods, first from the railway to the warehouse, and again from the warehouse to the ship's side, would be saved. And again as regards the transit of goods from Calcutta itself or its neighbourhood to Diamond Harbour, for which a charge would necessarily have to be made, we believe that (under such a system as is described in the next succeeding paragraph) that charge would not be greater, and that it would probably be less than the expense now actually incurred in moving goods by the very imperfect means of transport afforded by country carts and boats from the merchant's godown to the ship's side. It cannot be doubted that the Railway administration in connection with the docks would make such arrangements as would afford the greatest possible facility for the collection, despatch, and delivery of goods, and that the saving thus effected would constitute a substantial percentage on the value of export produce.

50. Proceeding to the consideration of the question of the inconvenience of Diamond Harbour, if we assume the existence of docks at that place, it appears to us to follow naturally that it would be to the interest of the proprietors of the docks and of the railway to afford every facility to trade. Sooner or later the docks and the railway would be under the same administration, and then undoubtedly a complete agency would be established for the receipt and delivery of goods. Suitable premises and warehouses would most certainly be provided at one or both ends of the railway, *i.e.* at Calcutta and at the docks, where all such operations as examining, cleaning, sorting, packing, and marking could be executed at a comparatively small charge, and at much greater convenience to the merchant. As evidence of the probability of this view being realized, we would refer to the fact that the Port Commissioners have proposed to build a tea warehouse within the jetty premises which will be available for the storage, sampling, sale, and shipment of tea. We would also refer to the recommendations of the Committee lately appointed to discuss the question of a central railway station in Calcutta. We understand that they proposed the erection of a goods depôt at Haisee Bagan alongside the Circular canals, connected with the trunk lines of railway and with the Port Trust and Diamond Harbour Railways. The area proposed to be acquired for the central depôt is 189 acres, with a frontage of 8,250 feet on the canal. It would thus be in direct communication with Diamond Harbour both by rail and by canal, if, as we recommend at the conclusion of this report, the canal be extended to meet the docks.

Mr. Bruce's scheme considered.

51. Before we proceed to express our opinion of the Diamond Harbour scheme generally, we think it desirable to review as briefly as possible the alternative scheme which has been recommended by Mr. W. Duff Bruce, the Vice-Chairman of the Port Commissioners, now absent on leave. The Mutlah ship canal scheme, as now brought forward by him (appendix, page xlix*), deserves careful consideration, for if it, or some modification of it, could be conveniently carried out, and at a reasonable cost, it appears to be capable of providing trading facilities equal to

* Page 305.

any which may be expected from docks at Diamond Harbour. We recognise Mr. Bruce's difficulties in being at a distance, and can only regret that he has not been able to go more fully into the details of the project, for in attempting to consider the matter, however superficially, we are obliged to assume many important particulars which are not even alluded to by him.

52. The chief features in this scheme are—

(1) To remove the Howrah bridge to the north of the Neemtollah ghat.

(2) To dredge a ship canal from Chitpore to a point about six miles below Port Canning on the Mutlah river. The canal to have generally the section of the Suez Canal, and to be deep enough for vessels of from 23 to 25 feet draught of water.

(3) To construct a lock at the junction with the Mutlah.

(4) To construct a dock near Sealdah, apparently about the size of that suggested for Diamond Harbour.

(5) To connect the canal with the existing canals around Calcutta, and

(6) To make a "cut" from the dock to the Hooghly river.

Certain other details appear to follow as a matter of course, such as—

(7) The construction of a lock somewhere between the dock and the Hooghly.

(8) The construction of opening bridges at two places where railways, and at least two other places where main roads, must cross the canal.

(9) The provision of ferries at suitable places along the length of the canal; and

(10) The closing of the Pialee river and other water-courses in the line of the canal.

53. In attempting a rough estimate of the whole of the suggested works, we have assumed that the level of the water in the dock and canal is to be maintained by means of the locks at the same level as that in the present Circular canal, with which it is to be connected, viz. about six feet above mean sea level, or at about four feet below the ordinary level of the ground. We have assumed the latter to be about the same as at Diamond Harbour, and that the sections of the canal will be similar to that of the Suez Canal, viz. 72 feet wide at the bottom, with sides sloping 2½ to 1. The amount of material to be excavated or dredged to form the canal and "cut" will amount to about 6,500 lakhs of cubic feet. We accept Mr. Bruce's estimate (£750,000 or about Rs. 14 per thousand feet) as being approximately correct for this portion of the work, though whether it be sufficient or not must depend a good deal on the distance to which the spoil may have to be carried.

So far as we are in a position to estimate from the data at our command, the total cost of the suggested works, exclusive of the purchase of the land, would probably be about as follows:—

	Lakhs.	Lakhs.
Dredging canal and cut (£750,000)	90	
Removal and lengthening of bridge and provision of new approaches, say	6	
Lock at Mutlah	14	
Well foundation for ditto	11	
Dock	32	
Lock at Hooghly	14	
Wells, foundation for ditto	11	
Pitching slopes of canal	15	
Four opening bridges, each with 80 feet clear water passage, including cylinder foundation and piers, girder approaches over the inclined sides of the canal, and all machinery, &c., say, average 5 lakhs each	20	
Diversion of railways and roads during construction of bridges, say	2	
Ferries, say	0·5	
		215·5
Contingencies, say 10 per cent. ..		21·5
Assumed total for a draught of 25 feet exclusive of land ..		237

54. Admitting for a moment the scheme to be feasible on financial and other grounds, there are two points in which, in our opinion, certain modifications would be necessary, both tending to increase the cost of the undertaking. We consider that, by limiting the canal to the use of vessels not exceeding 25 feet draught of water, its utility would be to a great extent neutralized, seeing that we have it in evidence that vessels drawing 26 feet have lately come to Calcutta. Looking to future requirements, and making allowance for a certain deposit of silt, the canal at the outset should not be less than 28 feet deep. We also consider that, to guard against the possibility of the larger vessels being either imprisoned in or cut off from Calcutta in the event of repairs to the gates, &c., the locks, or at least that at the Mutlah end of the canal, should be in duplicate. These additions bring up the estimate to—

	Lakhs. Rs.	Lakhs. Rs.
Dredging as before	90	
Add for extra depth	13	
	—	103
Removal of bridge as before	..	6
Lock at the Mutlah	14	
Duplicate	14	
	—	28
Wells for lock	11	
Do. for duplicate	11	
	—	22
Pitching slopes of canal	..	15
Dock (3 feet deeper)	..	37
Lock at the Hooghly	..	14
Wells for ditto	..	11
Bridges as before	..	20
Diversion of lines, &c., as before	..	2
Ferries	..	0·5
		258·5
Contingencies 10 per cent.	..	25·5
Assumed total for a draught 28 feet, exclusive of land	..	284

55. In estimating the outlay on works situated to a great extent in or near Calcutta, the cost of the land becomes an important item. The dock and appurtenances will probably occupy about 120 acres in a position where property is already of considerable value. About 800 acres will be required for the canal and slopes, and of this the cut to the Hooghly and a portion of the Calcutta end of the canal also pass through comparatively valuable property. Should it be intended to deposit any considerable portion of the spoil from the canal on the banks, it will be necessary, allowing for a safe berm, to take up about 4,000 acres. We fail to see any suitable place of deposit for the spoil from the dock and the Hooghly cut, without carrying it some distance, as for instance to the Salt Water Lakes.

The value of the land which would have to be taken up for the canal and dock, exclusive of any extra space for spoil banks, we estimate at not less than 45 lakhs, bringing up the assumed total cost of the whole scheme to 329 lakhs.

56. With respect to the advantages of the present "warehouses, water-supply, gas, and drainage," there can be no doubt that its proximity to a supply of good *water* gives this scheme an advantage over that at Diamond Harbour, the estimates for which are charged with 5½ lakhs for this item alone; but we attach little importance to the other points alluded to. The existing *warehouses* could be of little use to a dock two or three miles away, except at a considerable cost for transport. *Gas* would probably not be required at Diamond Harbour, as it is intended that the dock should be lighted by electricity as is now done at the Albert Dock on the Thames. And with respect to the *drainage*, seeing that the existing city drainage will necessarily be interfered with and have to be diverted more or less in carrying out the Mutlah scheme, it is probable that under this head the Diamond Harbour scheme will come out best.

57. Apart from the cost of Mr. Bruce's scheme, there are local and other objections which we think should have some weight—

(1) The removal of the Hooghly bridge from its present site. Although on the completion of the East Indian Railway bridge, the purely railway traffic will be almost eliminated, the communities situated on the two sides of the river would be greatly inconvenienced if the present means of communication should be interfered with. This is altogether contrary to the general tendency at the present time, which is for riverside towns to afford every facility for rapid communication between the two banks of the river, and to bring them into the closest relationship.

(2) The partial severance of the roads and railways towards the north of the city, at present its most important outlet.

(3) Our colleague, Mr. Levinge, is of opinion that the channels of the Mutlah will deteriorate, when the Salt Lakes, which at present encourage the tidal flow, are reclaimed,—a work which is now in contemplation, and must ere long be carried out.

(4) As a minor matter, very great difficulty was experienced in closing a bend of the Pialee river cut off by the construction of the Calcutta and South-Eastern Railway bridge.

We believe that some of these objections might be overcome by fixing the site of the proposed Hooghly entrance at Garden Reach instead of at Chitpore, and the professional members of the Committee are of opinion that any ship canal to the Mutlah should be at a high level as suggested by Mr. Dejoux, and be filled with water from the Hooghly only, pumped as required from suitable settling tanks.

58. We now proceed to apply the facts, opinions, and calculations embodied in the foregoing paragraphs to the consideration of the specific questions on which we have been directed to report, and we think that this will most conveniently be done under the three following heads:—

1. Whether it is desirable that wet docks should be constructed in the Hooghly.
2. Whether Diamond Harbour is the best locality for such docks.
3. Whether docks at Diamond Harbour would be financially successful.

59. We have shewn that the want of improved accommodation in the port of Calcutta has been the subject of discussion for upwards of fifty years; that the trade of the port has been increasing rapidly, especially of late years, since the opening of the Suez Canal; that the total tonnage of sailing vessels visiting the port remains much the same, whilst that of steam vessels has increased considerably, and that the tendency is to build both ships and steamers of a larger size, the navigation of which in such a river as the Hooghly is more hazardous, and the loss of which involves the loss of much capital; that the navigation of the Hooghly and the detention of vessels in the open river while in port presents dangers of a very appreciable kind, the avoidance of which is much to be desired; that the improvements effected by the Port Trust since its creation in 1870 have to a considerable extent met the demands of the growing trade up to the present time; that there is not room within the present limits of the port for much further expansion of those improvements; and that it may be anticipated with certainty that when the railway bridge at Hooghly is completed, and the railway systems of Bengal, which are now in progress, are further developed, the need for improved and extended accommodation in the port will become most urgent.

60. On the whole therefore we are of opinion that the first question may safely be answered in the affirmative. We pass to the second question, whether Diamond Harbour is the best situation for the docks.

61. Docks at Diamond Harbour would have three principal advantages: they would enable vessels to escape the intricate and dangerous navigation of the upper reaches; they would effect a saving of time, coal, pilotage, and towage, the money value of which alone would be sufficient to cover the dues payable for the use of the docks; and they could be constructed and maintained at much less cost than docks constructed at Calcutta. These advantages are so important that we think it necessary to dwell upon them.

62. If docks were constructed at Calcutta with an approach only from the Hooghly as at present, it would be found (1) that the dangers of the

navigation of the river would remain as formidable as ever; (2) that there would be less saving to compensate for the cost of using the docks; (3) that the cost of constructing the docks would be very largely increased by the higher price of the land, and by the much more expensive approaches by rail or road leading through populated suburbs, and therefore requiring numerous expensive crossings; (4) that the dues payable for the use of the docks would consequently be much higher; and (5) that their use would be a tax upon trade to a certain extent. If, on the other hand, the dangers of the Hooghly be considered sufficiently formidable to warrant their avoidance by means of the project for a ship canal to the Mutlah, all the disadvantages just enumerated, not even excepting the first, would be intensified; for it is not too much to assume that, if, to use Mr. Bruce's expression, we have a second string to our bow, and the approach to the port is affected by two different channels, each of which will require its staff of pilots and tugs, its buoys and lights, the revenue available to maintain the efficiency of these will be spread over a much larger field, and therefore produce less satisfactory results. It is not the object of the Diamond Harbour scheme, nor is it claimed for any scheme that has been brought to our notice, that it should monopolise the trade of the port. The object is merely to supplement the existing conveniences and appliances of the port by providing docks which some of the shipping will find it convenient to use. It appears to us that this object will be best secured by placing the docks on the Hooghly, but at some point sufficiently low down the river to make the shortening of the voyage a tangible saving. In this way the same pilots, the same tugs, the same light-ships, the same buoys, and the same river administration will continue to serve the whole of the shipping. But a scheme like the ship canal to the Mutlah can hardly be considered as merely supplementing the facilities of the port. To be successful financially it must become the port itself to the exclusion of the Hooghly and everything belonging to it. It must have a monopoly of the trade, and on these terms we think its success could not be secured, and that if secured it would ruin the existing property of the Port Trust. This is a risk that is entirely avoided by the Diamond Harbour scheme.

63. On the other hand, our enquiries have shewn us the existence of a strong, though not universal, feeling among the mercantile community that the transfer of a part of the business of the port to Diamond Harbour, or to any similar locality, would be attended with much inconvenience and expense. It would be necessary, it is urged, to keep up double establishments, and to rent a double set of warehouses: matters of importance will either have to be settled by subordinates, who will be unfit to deal with them, or will have to be delayed for the decision of a principal, who will be forty or fifty miles away. The value of the property of the Port Commissioners and of the owners of godowns in Calcutta will be seriously depreciated. The example of Port Canning is sufficient to shew the danger of attempting to divert trade into new channels.

64. While we are not insensible to the force of these arguments, we are not prepared to accept them as conclusive objections to the scheme of constructing new docks. The course of business will accommodate itself in Calcutta, as it has done elsewhere, to the modified conditions which circumstances may render necessary. How it will probably do so we have already indicated in paragraph 50. We are not aware that the London merchants find any obstruction to their business in the fact that their vessels load and unload in docks at Blackwall or North Woolwich,* although almost all imports of produce, such as tea, &c., have to be examined on being landed by clerks or other professional examiners. We do not imagine that double establishments will be required, or that anything more will be necessary than the occasional deputation of a clerk on a railway journey of one or two hours. There is not, in our opinion, the smallest ground for apprehending that the establishment of the docks will have an injurious effect on the value of the property of the Port Commissioners, or of private owners of warehouses. We see nothing extravagant in the supposition that, at the end of another decade of years, the tonnage of the Hooghly may be double what it is at present. There

* Docks are projected still further down at Daggenham and at Purfleet (opposite Gravesend).

will be ample work for all to do, and the new docks will merely provide an outlet for traffic which would otherwise be turned away from Calcutta for want of space. The failure of Port Canning merely shews that trade will not move into new channels without sufficient inducement to do so. It affords no argument against the success of a scheme which offers substantial advantages.

65. The location of the railway terminus at Diamond Harbour indicates that place as the natural position for the docks. But independently of this consideration, there is much to recommend the locality for the purpose. A dock much higher up the river would not save vessels from the dangerous part of the navigation: a dock much lower down would be too far from Calcutta to be convenient. Off Diamond Harbour there is good anchorage and sufficient space for about 30 vessels to moor without interfering with the fairway for navigation. A part of the land which would be required for the docks is already the property of Government, and the remainner could be acquired at comparatively little cost. Finally, Diamond Harbour is already a recognized place of call for ships, especially on the outward voyage.

66. At the same time there are considerations on the other side which should not be overlooked. Diamond Harbour is believed to be unhealthy: the supply of drinking water is bad; the subsoil, although perhaps not worse than in other parts of the delta of the Ganges, does not readily admit of the excavation of docks; the tides are at times so strong that vessels might sometimes have to wait until comparatively slack water before entering the dock, and there is the serious objection that the entrance to the docks would be on a lee shore during the south-west monsoon.

67. We can hardly hope to find a locality free from all drawbacks, and we are not disposed to think that these objections need interfere with the selection of Diamond Harbour as the site for the docks. The alleged unhealthiness of the place will probably disappear when the ground is drained and occupied. A supply of good drinking-water can be secured, partly by digging tanks for rain-water, and partly by laying a pipe from Calcutta, for which provision has been made in our estimate. The unfavourable character of the subsoil (supposing this to be borne out by further experiment) will add somewhat to the cost of the dock, but will not affect its stability. The tides are not stronger at Diamond Harbour than elsewhere in the river, and it may fairly be said that all the foregoing objections would probably apply as forcibly to any other place which might be selected for the docks as they would to the locality which we recommend The difficulty about the lee shore in the monsoon is of a different kind, and it has been strongly pressed upon us by gentlemen who have had many years' experience of the Hooghly. We desire, however, to invite attention to the following remarks recorded by our colleague Mr. Wawn:—

> Since the last meeting of the Committee I have enquired more particularly into the reasons urged against the "lee shore," and I am satisfied that whilst some of the local nautical gentlemen appear to see no difficulty, others have, unintentionally, exaggerated the supposed dangers during the monsoon. Men who have spent the greater part of their lives in India have had few opportunities of observing the working of large wet-docks, and naturally revert to *graving* docks as the nearest example. Captain Taylor, I. N., in his letter dated Calcutta, the 8th March, suggests a Committee "including practical men, who have docked vessels either *here* or at Bombay Prince's Dock," and other gentlemen, whom I have since consulted, speak in similar terms. In arriving at a decision on the subject, the Committee should bear in mind that there is little analogy between a light vessel (with comparatively slight hold of the water, and presenting a great surface to the wind) being slowly warped into a graving dock very little larger than herself, and the same vessel steaming or being towed through a wide entrance into a large wet dock. In coming out of dock the conditions are still more favourable. I have no hesitation in saying that Diamond Harbour is not the place which I should choose for the entrance to a *graving* dock.

We are inclined to believe that the apprehensions which have been expressed are in some measure due to a want of practical acquaintance with the working of wet docks. Mr. Wawn has reminded us that, in former days, Diamond Harbour was the recognized port of Calcutta, large vessels seldom coming higher up the river; and he has also brought to our notice that at Sunderland the existence of a lee shore is not (unless under exceptional conditions of weather) found to be an obstacle to the docking and undocking of ships. It

would, we think, be advisable that careful observations of the weather at Diamond Harbour should be made during the approaching monsoon, but we do not consider that the fact that the dock entrance will be on a lee shore need prevent the provisional acceptance of the locality as the site of the docks.

68. If it should be found that these objections are valid as against the precise spot chosen for the docks, we are nevertheless of opinion that the scheme should be adhered to, and some other neighbouring spot free from these objections should be chosen. On this point we would draw attention to our colleague Mr. Wawn's letter at page v of the appendix,* pointing out the advantages of a site near Roychuck, 4½ miles higher up the river than Diamond Harbour Creek. He suggests that if this site should be found preferable, a very profitable river-side railway could be made to it, and connected to the existing Diamond Harbour Railway, thus affording a double means of access to the docks. The profits of these railways would, it is expected, add materially to the financial success of the docks.

69. With regard to the third question, whether docks at Diamond Harbour would be financially successful, we beg to refer to the figures given in paragraph 41 of this report. The calculation there made appears to justify the conclusion that, if the docks can be constructed and maintained at a cost representing an annual expenditure of seven and a half lakhs of rupees, the outlay would be recouped by the receipts from 468 vessels, at an average of Rs. 1,600 each. The figures also shew that, at this rate of payment, which is taken as equivalent to a charge of 14½ annas per register ton, there would be a considerable saving as compared with the present port charges, so as to afford a substantial inducement to vessels to avail themselves of the accommodation provided by the docks. We therefore think that there can be no doubt of the financial success of the undertaking, unless it can be shewn either (1) that the docks would cost more than the estimated sum, or (2) that they would not be used by so many as 468 vessels, or (3) that the saving to each vessel by the use of the docks would be less than our calculation shews it to be. On each of these points we desire to submit some further remarks for the consideration of Government.

70. We have assumed that the outlay upon the docks will not exceed seven and a half lakhs of rupees per annum. It will be observed that we have not taken into account two items—the cost of acquiring the land, and the accumulated interest during the period of construction. We have no data for estimating the former, and the latter will depend upon the activity with which the work of construction may be prosecuted. But the cost will not in either case be large, and our estimates have been framed upon so liberal a scale that we do not anticipate that these items will require any material addition to be made to the total.

71. We have calculated that the cost of the docks will be covered by 468 vessels at an average payment of Rs. 1,600 each. In the year 1880-81 we find that 506 steamers and 478 sailing vessels arrived at Calcutta against 442 steamers and 454 sailing vessels in the previous year. We have already remarked that we anticipate a large increase in the shipping of the port, and we expect that this increase will be stimulated by the recent reduction of the port dues to 1 anna per ton. But it will be seen that even if the number of vessels remained stationary, and only one-half of them used the docks, the number which we have assumed to be necessary would be more than attained. We think it probable that sailing vessels in particular will largely avail themselves of the advantages of the docks, as the benefits in their case are comparatively greater than in the case of steamers. It would not perhaps be an extravagant supposition to conjecture that by the time the docks are completed the number of sailing vessels alone which would enter them would be sufficient to furnish the receipts which we have assumed to be required. While, owing to its proximity to the Suez Canal, Bombay has a great advantage over Calcutta in the matter of steamer freights, the rates of freight between Calcutta and Bombay and England by sailing ships are much the same. Ship freights from England, however, are generally considerably lower than steamer freights, and any facilities tending to cheapen the port and give greater facilities to ships must therefore help to neutralize the geographical advantages possessed by Bombay.

* Page 300.

72. The saving to vessels by the use of the docks would probably (and especially in the case of sailing vessels) exceed the estimate which we have given. We have allowed Rs. 1,200 for towage up and down between the Sandheads and Diamond Harbour; but it is probable that many sailing vessels would dispense with the aid of steam at the Sandheads, and would only incur the charge for towage into and out of the docks and down to sea. On the other hand, it will be seen that we have not allowed for the railway charges between Diamond Harbour and Calcutta. It is difficult to estimate these, as they will probably not affect cargo (either export or import) which may merely be sent through Calcutta without being warehoused there. For example, the railway charge from Cawnpore to Diamond Harbour, or from Diamond Harbour to Cawnpore, may be expected to be the same as between Cawnpore and Calcutta. For goods warehoused in Calcutta, the railway charge between Calcutta and Diamond Harbour may be estimated at about one rupee per ton. We have retained the port hospital due, as it will be necessary to make provision at Diamond Harbour for the treatment of sick seamen, and it is reasonable that the shipping should pay for this charge.

73. The design and size of the docks are discussed in the letter of our colleague Mr. Wawn, which is printed at pages i to iv of the appendix* to this report. That letter and the drawings which accompany it give a complete description of the design, and we need not attempt any further description of it in this place. We agree with our colleague in thinking that the site marked F is preferable to the others, and that the dimensions of the docks should be those which he has recommended for adoption. It will be seen that the design provides effectual protection against a storm-wave, and that there will be sufficient space within the enclosure for warehouses and other necessary buildings. Provision is also made for a supply of drinking water and for drainage.

74. In addition to the cost of the dock itself, it will be necessary to provide for the construction of godowns, &c., from which a separate and remunerative revenue will be collected.

75. To furnish the whole dock we estimate the cost at—

	Rs.
Godowns, 120 feet wide, on each side of the dock (Rs. 2-8 per foot)	24,00,000
Say 5 miles of rails and sidings	1,72,500
Say 40 steam or hydraulic cranes	2,80,000
Total ..	28,52,500

It will be advisable to erect only a portion of these at first, and the remainder from time to time, in answer to the requirements of the traffic.

76. It will also be advisable to acquire and reserve the site of the docks as indicated by plan F, together with a certain portion of the river frontage and to let the ground out only on short leases. If appropriated to railway purposes no permanent structures should be built thereon. We further recommend that steps should be taken for the extension of the boat canal to Diamond Harbour.

H. J. REYNOLDS.
H. C. LEVINGE.
S. T. TREVOR.
BRADFORD LESLIE.

Subject to reservations in my memo. of dissent.

J. J. J. KESWICK.

Subject to material reservations as expressed in my "dissent."

G. H. MORRISON.
CHARLES WAWN.

* Pages 296—300.

DISSENT.

I REGRET to have to dissent from some of the views of my colleagues expressed in the report—

Paragraph 59.

1st.—I do not consider that there is not room within the limits of the port for much further expansion of improvements, but agree with Mr. W. D. Bruce (*see* appendix, page xlix) that the present accommodation can be considerably increased. My enquiries lead me to believe that it is possible for the Port Commissioners to acquire land on both sides of the river from Garden Reach downward sufficient to double the accommodation of the port and provide sufficient warehouse and jetty room.

Paragraphs 62-63.

2nd.—If docks were to be constructed at Diamond Harbour, and to prove as economical and attractive as indicated in the report, I am convinced that some of my colleagues would find that they had made a mistake in thinking that in favouring the Diamond Harbour scheme they had "entirely avoided" depreciating the value of the existing property of the Port Trust. It is claimed in paragraph 64 that the new docks will merely provide an outlet for traffic, which would otherwise "be turned away from Calcutta for want of space;" but I have no hesitation in saying that Diamond Harbour would fare very badly if it were wholly dependent for its income on vessels which could not find accommodation in Calcutta. It can only be a success if the time and charges which vessels will save by going there make it more profitable for them to use its docks than to proceed to Calcutta, and if more profitable to the extent of the figures shewn, then Calcutta will only get the traffic "turned away from" Diamond Harbour "for want of space." If docks at Diamond Harbour give the advantages indicated in the report, I take it that the accommodation will not remain stationary, but that the building of docks will be proceeded with to meet the demand, and to expect ship-owners to continue to send their vessels to Calcutta and to calculate at the same time that by stopping at Diamond Harbour they can save Rs. 500 to Rs. 2,500 per voyage is to expect ship-owners either not to believe in such calculations or to have no eye to economy, whereas any one who has had experience of them knows that they recognise as quickly as their neighbours that a penny saved is a penny gained. We cannot expect that the ships which now come to the port of Calcutta will always continue to come to it, and that the additional ones which the increased trade will attract will be sheltered exclusively in Diamond Harbour. If the new port is to be successful, it must be used by about 468 vessels at least, and if it hold out sufficient inducement to attract that number, whether from increas d trade or from the present trade of Calcutta, as exampled in paragraph 71, it must, in my opinion, do much to lower the value of property in this city. Experience alone will shew whether shippers from home or other outports will pay as high freights and ship as readily to Diamond Harbour as to Calcutta, or whether exporters will pay as high freights and ship as readily from Diamond Harbour as from Calcutta. The concensus of opinion of merchants is against Diamond Harbour, and the calculation for ship-owners, if vessels earn higher freight by coming to Calcutta, will be whether the extra freight earned is a sufficient set-off against the saving the ship would have made by stopping at Diamond Harbour. It is possible that for some cargoes, both inwards and outwards, Diamond Harbour will have the pull, while for others Calcutta will be preferred; but I think one of two things will happen—Diamond Harbour will be a failure or Calcutta will be much injured. If the Port Commissioners, after the adoption of the Diamond Harbour scheme, if adopted, wish to raise another loan, I think they will probably find the views of the public unmistakeably expressed. That the docks, if constructed at Diamond Harbour, and the railway to them, should be under one administration, I grant, but would deprecate permitting any company to construct and work docks at Diamond Harbour. If docks are to be constructed there, or anywhere else, to serve Calcutta, they and the present port property must, in my opinion, be under one administration and worked together for the general good, so that in considering either the Diamond Harbour scheme or Mr. Bruce's scheme, the reduction of income in connection

Paragraph 69.

with the existing property of the Port Trust must be considered along with the probable income from the new scheme

3. I do not think that in weighing the objections to the Diamond Harbour scheme, which Calcutta merchants have advanced on account of the inconvenience and expense of doing business at such a distance from Calcutta, the example of London merchants sending their clerks or professional examiners to vessels loading or unloading in docks at Blackwall or North Woolwich, as put forward in the report, is a happy one. Trains, steamers, and omnibuses run between London and these docks, distant 5 and $8\frac{3}{4}$ miles respectively, every few minutes; and it is easier and quicker to get to them from the city of London than it is to get to Garden Reach from the city of Calcutta. So many passengers travel that it pays to start trains often, and the speed is greater than here. It is calculated that Diamond Harbour will be reached by a railway journey of one to two hours, but I think we may safely say that it will rarely be accomplished under two hours or more, as we shall probably have mixed trains, partly goods and partly passengers, and many stoppages, so that one might get from London to Brighton and back by the fast expresses which run so often, in the time that it would take to get from Calcutta to Diamond Harbour, while Portsmouth, 75 miles from London, and Southampton, 77, can both be reached quicker and oftener per day than we are ever likely to reach Diamond Harbour if trains travel here as slowly as usual. The P. & O. Co. have found it profitable to give up Southampton, and run their vessels round a long coast to London. North Woolwich and Blackwall are actually parts of London, and docks were only constructed even at these short distances from the city because there was no room nearer. Gravesend, near which new docks are now to be made, is only 22 miles from London, and you can get there almost as quickly as from Calcutta to Barrackpore.

Paragraph 64.

4. The memorandum furnished by Mr. Bradford Leslie and quoted in the report, shews an enormous increase in the railway tonnage in the past five years, and indicates, with good reason, an even greater increase in the next five; but an entire change will have to take place in the system of doing business before whole cargoes of grain, seeds, and other produce are bought up-country, assorted there by the shippers, and despatched right to the ship to be transferred at once from the railway wagons to the ship's hold Mr Morrison has entered into details as to how business is done at present, and it is unnecessary for me to do so, but I would call prominent attention to the fact that Messrs Ralli Brothers, who are the largest exporters from this country, state emphatically that "the proposed scheme far from affording any advantage, would tend to cause many inconveniences both to importers and shippers." They state that at present of the seeds and wheat exported 40 per cent. are not warehoused; but ask it to be noted that whatever quantity is exported direct from the Howrah railway station is subject to examination by the shippers in the presence of the sellers in order to ascertain condition, quality, weight, and refraction of the different parcels before shipment, and that such operation could not be effected satisfactorily at Diamond Harbour unless at the great expense of each shipper and seller keeping a separate establishment there.

As stated by Mr. Morrison, "our exports are the produce of the soil, and scarcely two lots offered to the merchant are quite alike;" and all who have had experience in shipping produce from this country—a country for which a Cotton Frauds Act was drafted—know that vigilance is required before produce is shipped. If Diamond Harbour be made a shipping port, and have the success expected, the system of business pursued in this country cannot fail to make it a great emporium of trade, as well as a place of export; and I doubt if the saving in municipal taxes, calculated on, will be realized, while probably it will be found that the Calcutta Municipality will object to supply the filtered water, for the conveyance of which allowance is made in the estimate.

Paragraph 47.

5. In conclusion, I have to say that I consider the dangers of the river above Diamond Harbour are somewhat magnified, while those below are not sufficiently allowed for. Of 26 wrecks in the river in the last 20 years we are told that only 10 have occurred above, while 16 have taken place below,

and professional opinions have been expressed that if ever the river closes to navigation, the closing is more likely to occur below than above Diamond Harbour. I would advocate, then, that before proceeding further with reference to Diamond Harbour, steps be taken to ascertain what further accommodation can really be provided for shipping by the erection of jetties and warehouses within the limits of the port of Calcutta, and what further land can be acquired on both sides of the river at Garden Reach and below it, suitable for jetties and wet docks, with its probable cost. That wet docks can be constructed at Diamond Harbour, and that they may, by their proximity to the sea, save the time of vessels as well as much expense in towage and pilotage, I believe; but I ask it to be considered whether, if a saving per vessel per voyage of between Rs. 500 and Rs 2,500 is to be effected by stopping at Diamond Harbour, ship-owners will sacrifice it and go to Calcutta. If they will not, how is Calcutta to remain uninjured; and if, on the other hand, such saving cannot be effected by stopping at Diamond Harbour, where will be the inducement to vessels to stop there, and what will warrant an outlay of a crore and a half of rupees in that new place?

CALCUTTA,
The 3rd May 1882.

J. J. J. KESWICK.

DISSENT.

I AGREE generally with Mr. Keswick in his conclusions, but I doubt how far the Port Commissioners of Calcutta could efficiently control docks 45 miles away; and I doubt also whether, having regard to the nature of our river, it would be prudent to spend large sums of money on docks or other such appliances having access to the sea only through the Hooghly.

I think it would become prudent to do this only when it had been decided to excavate a ship canal to the Mutlah, either at once or hereafter, as necessity might appear.

It follows that I am opposed to the construction of docks at Diamond Harbour, and particularly I am so for the following reasons:—

1. Because we cannot confidently say that the channels between Diamond Harbour and the sea will admit of the free passage of vessels of the latest type, much less of the probable type of the future.
2. Because safe entrance into, and egress from, the docks will, during a sensible portion of the year, be questionable.
3. Because docks at Diamond Harbour, if successful, would gravely prejudice Calcutta as a centre of trade, and probably ultimately destroy it as a port.
4. Because it is probable that the interests of Bengal at large can be effectually provided for, not only without impoverishing, but by means which must greatly enrich its capital.

I have fully dealt with these points in a letter to the President of the Committee, printed in the appendix* at pages vi to x.

I dissent entirely from paragraph 62. If the Mutlah scheme were found feasible, "(1)" the dangers of this river, "the Hooghly," would cease altogether to be formidable, because they would be avoided; "(2)" there would be, on everything landed and shipped, a saving at least equal to that which could be effected at Diamond Harbour; and on much of our imports and exports a greater saving, viz. greater by the charge for railway transit between Calcutta and Diamond Harbour, and by the costs and losses attendant upon extra handling of goods; "(5)" the "tax on trade," which the Mutlah scheme would impose, would be simply the price paid for a much larger benefit. The docks of the ship canal would be in the port and part of the port, and the "ruin" they might inflict on the existing property of the Trust (so far as it did not prove imaginary) would be the "ruin" which a capitalist inflicts on his old plant when he introduces into his own concern and for his own profit the most improved of modern machinery. I think the jetties would continue

* Pages 301—305.

to be used; but if not, the dock dues would amply maintain the Commissioners' income and their credit. How it can be said that stopping vessels 45 miles from Calcutta avoids the risk of ruining the property of the Calcutta Port Trust I am unable to understand!

Paragraph 57.—I feel much diffidence in approaching the objections to Mr. Bruce's scheme which have been raised by our professional colleagues; but I would say—

(1) That the cost of the ship canal system must be considered in the light of the advantages it will yield, and the general depreciation of property which it will obviate. I think, too, that no estimate of cost should be accepted until Mr. Duff Bruce had had an opportunity of explaining his views in greater detail, nor until a more deliberate estimate had been made of the cost of acquiring the necessary land.

(2) That the removal of the Hooghly bridge is no necessary part of the scheme.

(3) That the severance of the important outlets to the north of the city could obviously be avoided by cutting the canal from a point towards the southern end of the port.

(4) That if draining the Salt Lakes would spoil the Mutlah, it might be better to leave the Salt Lakes undrained.

Paragraph 50.—The scheme adverted to here, and which in paragraph 49 is relied upon as destined to effect great savings in cost of transit, viz. to construct in proximity to the Circular canal, and in communication with all the railways, a monster depôt or range of godowns, in which facilities should be provided for storing, examining, cleaning, sorting, packing, and marking, would no doubt prove of great benefit to Calcutta. But I do not think that any such arrangements would ultimately prevent our trade from leaving us; and if they failed to do this, much of the cost of the Calcutta depôt would be wasted. Moreover, as compared with the Mutlah canal scheme, the Hulsee Bagan godowns must necessarily leave upon trade a removable burden of at least Re. 1 per ton, viz. the cost of carriage to Diamond Harbour; and this, calculated upon the commerce of our port, would more than cover the difference between the annual income necessary to give a satisfactory return upon the capital required for the Diamond Harbour docks and the revenue necessary to give a like return upon the cost of completely carrying out the Mutlah project.

G. H. MORRISON.

OPINION OF MR. ROBERT STEEL.

I QUITE agree with the Committee that something must be done to accommodate the increased trade of the Port of Calcutta, which we must look for in the early future. The practical question at issue is whether this object can be best attained by the construction of docks at Diamond Harbour.

The alternative scheme, which was most prominently brought before the attention of the Committe, involved the construction of a dock in Calcutta itself, connected by a ship canal with the Mutlah, and also connected with the river Hooghly. I can offer no opinion as to the practicability of this scheme or its cost. Assuming, however, that the cost would be £3,000,000 as against £1,500,000 for the Diamond Harbour docks, I would consider the larger expenditure far preferable in every way. The canal from the Mutlah would evade the dangers of the Hooghly altogether; whereas the other scheme would not avoid the difficult navigation of the lower part of the Hooghly—the part where the channels are subject to the greatest disturbance, and where there seems to be the greatest fear of permanent deterioration.

At the same time, while expressing a decided preference for docks at Calcutta rather than at Diamond Harbour, I am of opinion that both schemes are premature, and that the means exist for providing for the accommodation of a trade, double in extent of that hitherto carried on, by improving the port of Calcutta itself. The first step in this direction should be the removal of the floating Hooghly Bridge to a point higher up the river. This bridge at

present strangles the port, and renders a large part of the river frontage comparatively valueless on account of the delays, dangers, and expense of bringing vessels through the bridge. The next step should be the utilization of the river bank below Chandpal Ghat. At present no use is made of this invaluable frontage, and Government has hitherto insisted that no scheme of port improvement shall be allowed to touch the frontage between Chandpal Ghat and Prinsep's Ghat. It appears to me that the time has now come for the removal of this restriction. The space in question should be made use of for the construction of jetties and for the loading of cargo boats. If this involves the removal of the Eden Gardens, the throwing back of the Strand Bank road, and even the removal of the Fort itself, still it appears to me the proper solution of the difficulty. The Fort has already been moved from the site of the Custom House to its present position, because it was in the way; and sooner or later it must for the same reason be moved again. Such value as it has consists in its capacity to prove a rallying ground in case of tumult, and a barrack for soldiers, rather than in any necessity for commanding the river approaches. Some time or other it may be desirable to construct a wet dock, either at Garden Reach or on the site of the present Fort.

I will not go over the detailed objections to the Diamond Harbour dock scheme which have been laid before the Committee. I will, however, state that, in my opinion, the scheme would not induce a large direct business between Diamond Harbour and up-country markets. Imports would continue to come to Calcutta and be distributed from thence. Exports would continue to come to Calcutta for assortment, packing, and sale. In my opinion any gain from saving of risk and expense by terminating a voyage at Diamond Harbour will be more than counterbalanced by the expense of railway carriage between Calcutta and Diamond Harbour. In expressing this opinion, I assume the correctness of the Committee's estimate of Re. 1 per ton for railway carriage. At the same time I believe that this estimate is quite inadequate, and I cannot think that the Committee have taken into consideration the great outlay which would be necessary for trebling the line of rails and providing in a suitable situation in Calcutta extensive godowns for receiving and delivering goods. If full use is to be made of such a dock as that specified for the Calcutta goods station would require to have almost as much accommodation as the East Indian Railway station at Howrah, and would involve very great expenditure.

In my opinion the proposed docks at Diamond Harbour would be unpopular on all hands, both with the owners of ships and also with shippers and importers of goods. As a ship-owner, I would not accept a lower rate of freight for a voyage terminated at Diamond Harbour if an expense of Re 1 per ton on the cargo for railway carriage was thrown on the ship. As an importer of goods, or an exporter of produce; I would by no means employ a ship or steamer terminating her voyage at Diamond Harbour, unless at a lower rate of freight than that charged by ships coming to Calcutta. The detailed reasons for these objections on the part of merchants to the employment of Diamond Harbour have been put before the Committee by others and need not be repeated. It follows from what I have said that in my opinion docks in Diamond Harbour would not be made use of until trade was reluctantly driven there by an absolute deficiency of accommodation at Calcutta.

The Committee was appointed to consider the Diamond Harbour scheme only, and had no instructions to examine alternative schemes in detail. In consequence the Committee has been unable to cover the ground absolutely necessary to give practical value to its report. The *real* question at issue involves the detailed examination of all the practicable alternatives—a task which, in the absence of instructions, the Committee could not attempt.

ROBERT STEEL.

No. 1, dated Calcutta, the 4th March 1882.

From—CHARLES WAWN, ESQ., M. INST., C.E.,
To—The President of the Committee on Docks at Diamond Harbour.

As a perliminary to the preparation of the general report of the Committee on Docks at Diamond Harbour, of which I have the honour to be a member, it appears to me desirable that I should recapitulate, in a letter to yourself, the various suggestions which I as the Special Engineer have at different times made to the Committee, and at the same time explain generally the special features of the designs which I have prepared.

GENERAL SCHEME OF THE DOCKS.

The general arrangement as shewn on the drawings is based on the supposition that although the dock as constructed at first may be comparatively small, it will shortly be found necessary to enlarge it, and, as the trade increases, eventually to supplement it by another. The space proposed to be enclosed provides for considerable extension of dock area and also for the construction of graving docks, which are certain sooner or later to follow. The locks and entrances have also been designed with these probabilities in view, although, at the same time I consider that duplicate entrances and gates are almost indispensable in any dock intended for first class shipping—the one affording a means of carrying on the traffic during repairs, and the other ensuring the safety of the shipping in the event of an accident preventing the closing of one of the gates.

I am decidedly of opinion that any dock constructed on the Hooghly would be a failure if it did not afford protection, not only from the ordinary dangers incidental to a tidal river but also from the much greater, though less frequent, effects of a cyclone wave. To meet this necessity, I propose to enclose the dock and appurtenances with an embankment or "bund" formed of the spoil from the excavation, and continued across the lock entrances where there must necessarily be a break, by gates of the same height opening outwards like those of a graving dock.

The most exact information which I have been able to obtain as to the height of the 1864 inundation is from a mark on one of the buildings at Diamond Harbour, which shews the maximnm height of the water to have been about 13 feet above the general level of the ground. My suggestion is that the dock bund should be eight feet higher than this, and that for strength and general utility it should be not less than 30 feet wide at the top with slopes of at least 3 to 1. Such an embankment, 21 feet above high tide of ordinary springs may eventually come to be of use to carry a high level railway, should coals ever be shipped in the dock; or huts may be built on it, as sleeping places for the sailors during the hot weather.

In view of the increasing length of the vessels for which accommodation is to be provided, it is a matter of importance that the course into the dock should be as easy and as nearly straight as possible. Much valuable time at the best part of the tide is lost in warping even a short vessel into an awkwardly constructed dock. Further, where it is practicable to make dock walls straight, there is a certain economy in doing so; vessels of different lengths are berthed without loss of quay space, and moveable steam and hydraulic cranes traverse the whole length of the quay without interruption.

It is desirable that an outer or half tide basin should form part of any dock establishment at Diamond Harbour, where at certain seasons of the year the water begins to fall rapidly immediately after high tide. The basin as designed is of sufficient width to afford also a turning place for vessels too long to be turned in the dock.

As the district around Diamond Harbour has (or had) the reputation of being unhealthy during the rains, the surplus material from the excavation may, with advantage, be applied to raise a portion of the land near the river to about the level of the dock bund affording a secure and comparatively healthy site for dwelling-houses, Custom House, &c., and at the same time a place of refuge in case of a cyclone flood.

Notwithstanding the extension of the railway system, and the increased proportion of goods carried by rail, there will always remain a considerable trade both in distributing and collecting, to be carried on in the rivers by the native craft. If the Committee should recommend the construction of docks at Diamond Harbour, I think they ought to consider also by what means these small vessels are to be saved the dangerous passage between that place and Calcutta. I would suggest, for consideration, that a shallow canal, from Tolly's Nullah to Diamond Harbour Creek, could be made by the side of the existing road at comparatively little cost, a considerable portion of the suggested site having been already excavated to form the road embankment. A siding and small landing jetty at the point where the railway to Diamond Harbour crosses Tolly's Nullah would also be of service.

SITE.

The small scale drawings which accompany this letter shew the different sites which on various grounds suggested themselves after my first visit to Diamond Harbour, and after carefully weighing the advantages of each, I am of opinion that that marked F is on the whole the most suitable. The principal reasons which led me to this conclusion, and the comparative merits and demerits of the various sites, may be briefly stated.

Sites A, B, and C, utilize the creek either wholly or in part, with the saving of about *one-third* of the total excavation (and that the cheapest part) near the top in the case of A, and of about *one-fourth* in B and C. Owing to the bends in the creek, however, a dock

so constructed, particularly in the case of A, would be far from satisfactory, and in any case we should have the cost of providing another outlet for the drainage water now passing through the creek.

Beyond the saving in excavation, which in this instance does not exceed three or four lakhs of rupees, there would be nothing gained in dockizing the creek. It would be altogether different if, as is sometimes the case, it were already used as a commercial harbour, and provided with wharfs, godowns, &c., and required only a greater depth of water at low tide to convert it into a first class dock.

In designs A and B I should be apprehensive also of an unequal settlement of the masonry of the locks.

Against site D, which utilizes the creek as a tidal basin, and which would otherwise have been very suitable, is the cost of widening and deepening the channel in the creek, involving dredging to the amount of about 300,000 square yards; the cost of a bridge about 300 feet long, and the danger of the creek deviating from its present course to an extent sufficient to necessitate a considerable annual outlay in keeping open the approach. That the creek is liable to alterations of this kind is, I think, shewn by an examination of the old bunds.

The site shewn on drawing E suggested itself as a means of utilizing the railway and both the stations as designed without alteration. It is, however, open to objection in the want of a straight course through the basin, and in the comparatively narrow anchorage ground opposite the entrance.

Site F appears to possess the balance of advantages. The drainage of the country is not interfered with. The creek remains to be used for subsidiary purposes, *i.e.* as a tidal basin for the smaller craft, &c. The entrance through the basin is nearly straight, and the anchorage good. The current from the creek will assist the dock sluices in keeping the entrance free from deposit, and should the creek at any time materially alter its course, the dock entrance is near enough to the river to be easily kept open. The railway station would be in a position on the bund convenient for the dock entrance, for the ferry, and for boats landing passengers from vessels in the river.

A certain amount of erosion of the Hooghly bank at Diamond Harbour was to be expected, and on comparing the oldest survey which can be found (30th June 1858) with that made last year, it appears that the bank on the west side of the entrance to the creek has suffered considerably, the old post-office building, which was then standing at a little distance from the bank, being now a heap of ruins below high water-mark. On the east side of the creek entrance, however, on which it is proposed to construct the dock, the loss has been comparatively small—as nearly as can be measured on the drawings, about 10 feet altogether, or less than half a foot per annum. Even should this rate of progress shew a tendency to increase, which is not unlikely, seeing that the protection of the opposite point has been to some extent reduced, many years must elapse, and probably other changes take place, before any question can arise as to the necessity for further protecting the dock works. The line of the river bank as it existed in 1858 is shewn on drawing No. 1.

During the south west monsoon the river bank at Diamond Harbour will be exposed to the full force of the wind, and present to a certain extent a lee shore. After consulting Mr. Yates, the Harbour Master, who has had many years' experience on the river as a pilot, it appeared to me that the difficulty would be sufficiently met by putting down buoys with screw moorings to check or steady the vessels whilst entering the locks during the monsoon months. Since that, however, Mr. Milner, another gentleman of experience as a pilot, says in his reply to the circular of the Committee that being to leeward in the monsoon, "it is a most unsuitable place for docking vessels." This is a question for a seaman rather than for an engineer, and not having had the opportunity of seeing the river during the monsoon I feel a difficulty about giving an opinion. I understand, however, that in the olden time the India men received and discharged cargoes here—presumably during the whole year—and that it was to all intents and purposes the port of Calcutta. The South Dock at Sunderland is successfully worked under what appear to be much worse conditions, for it is entered directly from the German Ocean, and except when a continued gale from the east raises a sea which would make it dangerous to vessels in the dock for the gates to be opened, no difficulty is experienced in entering or leaving the dock. Altogether, it is a point demanding careful consideration and the best nautical opinion we can get. If it should be made clear that the situation is *really* so rough and exposed as to make it unsafe for a vessel to enter a dock, I think we may dismiss at the same time any idea of jetties and coal wharfs, except on a small scale and as a temporary expedient to be used in fine weather only.

FOUNDATIONS.

The trial wells and borings undertaken to ascertain the nature of the deposit at Diamond Harbour have been delayed through various causes, and I am only now in possession of any real information on the subject. The operations are not yet complete, but so far as they have gone, I regret to say that the favourable opinion entertained by several gentlemen of experience has not been altogether confirmed. The walls of the dock, and possibly those of the basin, may, I think, be got in dry, but the locks, and the passages from the basin to the dock, will have to be founded on brick walls, which should be carried to a depth sufficient to afford a support equal to two tons per square foot over the whole surface. Each

well, after being filled with concrete, should be individually tested with this load; but the weight should in no case be applied until all the wells in the immediate vicinity have been sunk.

DETAILS.

IN anticipation of the report of the Committee being favourable to the construction of a dock, I have prepared, in addition to the small scale drawings of the different sites, a series of drawings enumerated in the margin, showing generally the arrangement which I propose, and going to some extent into details of construction.

No. 1. Site of dock and sections.
,, 2. Locks and sections.
,, 3. Entrance to dock and sections of walls.
Nos. 4, 5, 6. Gates.
No. 7. Diagram of tides.

"Datum," as in the case of the Diamond Harbour Railway, refers to *mean sea level.*

Accompanying the drawings is a diagram showing the highest and lowest tide in each month from 1872 to 1880, as recorded by the self-acting tide gauge at Diamond Harbour, and on which I have marked (arbitrarily of course) "H.T. rains," "H.T. dry season, springs," "H.T. neaps," and "L.T." Disregarding exceptional tides, these are, I believe, fair approximate levels, and are those to which I have worked in preparing the drawings. "Coping level" is placed at three feet above "H.T. rains," or two feet above the highest tide recorded by the gauge.

The bottom of the main dock is designed to be 23 feet below datum, giving a depth of 26 feet of water at H.T. neaps. The basin and locks are intended to be three feet deeper.

The dock, as constructed at first, is intended to be 4,000 feet long by 500 feet wide, the basin approximately 800 feet square, and the entrance locks respectively 560 feet long by 80 feet wide and 400 feet long by 60 feet wide.

The land for about 300 feet back from the walls is intended to be raised to the level of the coping. Provision must be made for draining the remainder, and this, I think, it will be safest to do by sluices into the basin, rather than through the bund.

It is intended that the excavation shall be got out, as far as possible, dry in the usual way, and that the remainder be dredged to the requisite depth after the water is admitted to the dock.

I desire here to refer more particularly to certain details of construction, necessitated by the peculiar features to be dealt with: (1) The nature of the foundation; (2) the great variation in the level of high tide; and (3) the cyclone wave. The two former affect chiefly the height and width of the walls. It is desirable in all cases, and more particularly in dealing with a deposit like that of the Ganges delta, to distribute the weight as evenly as possible over the foundation. The walls, as shown on the drawings, have been designed with special reference to this requirement, the line of pressure passing approximately through the centre of the base, not only when the wall is standing alone, but by reason of the steps at the back which receive increments of weight nearly in proportion to the horizontal thrust; also when exposed to the whole pressure of the earth behind.

I may mention that in designing the wall I have not considered it safe to assume that the earth backing, saturated with water as it will be, would naturally stand at a more favourable slope than about 4 to 1. The top of the piling is intended to be embedded in the concrete of the wall, and not placed in the front as a mere toe, which would be easily thrust out of the perpendicular.

Should the progress of the work on a large scale show that there will be any real difficulty in keeping the excavation sufficiently dry to get in the concrete foundations for the dock and basin walls as designed, it will be necessary to carry them on wells, in which case I should prefer to adopt the triangular section lately used successfully in the construction of the Stobcross Dock at Glasgow, and which I have shown, with alternative sections of the walls, on drawing No. 3. I trust, however, that it will not be necessary to resort to wells, at least for the dock walls, which are only five feet lower than the foundation of the lock at Chitpore, where no great difficulty has been experienced.

In order that the storm-gates when open may be no obstruction to the passage to and fro of the men attending on the vessels passing through the locks, it is intended, as shown on the drawings, that they be set back into the wall five feet further than the other gates, and that the break in the quay line be made good by a platform on the front of the gate. The gap at each end of the platform is intended to be bridged by a small moveable timber gangway, so constructed as either to be moved by the gate, or (if neglected) to form no impediment to the closing of the gate. The gangways should be such as will float in the event of their being accidentally thrown into the lock, lest by falling on the sill they should obstruct the closing of the gates. To ensure their being in working order, the storm-gates should be closed at least once in every 24 hours. The sluice doors at this point must hold water both ways.

I have not shown on the drawings the hydraulic or other machinery for working the gates, sluices, or swing bridge, the details of which depend greatly on the manufacturers.

FRESH WATER-SUPPLY.

I estimate that for some time to come it will be sufficient to provide good fresh water (in addition to what may be impounded in tanks during rain in the usual way) for an average of one passenger vessel and eight other large vessels per day, with an addition of 10 gallons per day for about 2,000 resident inhabitants. To bring this quantity from Calcutta will require, if supplied from a head of 40 feet, a pipe about 10 inches in diameter, which, in case of accidents, should deliver into a tank large enough to contain at least one

week's supply. When the demand increases beyond what the 40 feet head will supply, the quantity of water delivered by the same pipe may be increased by pumping to a pressure equal to a head not exceeding 120 feet.

ESTIMATED COST.

Subjoined are the heads of my estimate, in which I have included the cost of eight hydraulic capstans for hauling vessels through the locks, &c.

From the tentative character which part of the work must necessarily assume, it is difficult to estimate with accuracy the cost of the well foundations.

It should be noted that the bund, storm-gates, and water-supply, although necessary in this particular case and included in the estimates, are additions beyond the requirements of an ordinary dock.

	Lakhs.
Dock	42
Basin	17
Passages between dock and basin, and gates	6
Locks and gates	24
Wing walls	½
Hydraulic machinery and pipes	4
Bollards	½
Coffer dam	2
Granite for quoins	2
Swing bridge	½
Fresh water-supply	5½
Well foundations, say	23
	127
Contingencies, say, 10 per cent.	13
Total	*Rs. 140

The locks with their foundations are the most expensive part of the design. By reducing them to 200 feet long each, the total cost may be brought down to about 118 lakhs. I do not, however, think it would be desirable to do this, for, although there would still be duplicate gates and locks through which small vessels could be passed at low tide, the want of the larger lock would at times be greatly felt.

Pray bear in mind that this is to be considered merely as an *interim* report, and that both drawings and estimates have been prepared on the supposition that the borings, &c., now in progress, will show no more unfavourable results than those already completed.

BENGAL CLUB,
The 4th March 1882.

DIAMOND HARBOUR DOCK SCHEME.

MEMO. BY THE SPECIAL ENGINEER.

SINCE the last meeting of the Committee I have enquired more particularly into the reasons urged against the "lee-shore," and I am satisfied that whilst some of the local nautical gentlemen appear to see no difficulty, others have, unintentionally, exaggerated the supposed dangers during the monsoon. Men who have spent the greater part of their lives in India have had few opportunities of observing the working of large wet-docks, and naturally revert to *graving* docks as the nearest example. Captain Taylor, I.N., in his letter, dated Calcutta the 8th March, suggests a Committee "including practical men, who have docked vessels either *here* or at Bombay Prince's Dock," and other gentlemen, whom I have since consulted, speak in similar terms. In arriving at a decision on the subject, the Committee should bear in mind that there is little analogy between a light vessel (with comparatively slight hold of the water, and presenting a great surface to the wind) being slowly warped into a graving dock very little larger than herself, and the same vessel steaming or being towed through a wide entrance into a large wet-dock. In coming out of dock the conditions are still more favourable. I have no hesitation in saying that Diamond Harbour is not the place which I should choose for the entrance to a *graving* dock.

There is one point which has not been brought out at all clearly in the replies to the questions of the Committee. Mr. Steel showed that *time* would be saved in working cargo in dock rather than at jetties in the river, and in this he is corroborated by Mr. Morrison. But in addition to this there is a clear saving of *cost*, for the vessel being always practically at the same level with relation to the quay, gangways can be laid on to her decks and the greater part of certain descriptions of cargo lifted by her own steam cranes and wheeled or carried direct into godowns, or *vice versâ*.

BENGAL CLUB,
The 3rd April 1882.

C. W.

* *The Committee have added 10 lakhs for establishment during construction.*

No. 2, dated Calcutta, the 27th April 1882.

From—CHARLES WAWN, ESQ., M. INST., C.E., Special Engineer,

To—The President of the Committee on Docks at Diamond Harbour.

I BEG to report to you, for the information of the Committee, that since my letter of the 4th March, three borings have been made on the site of the proposed dock on the south side of Diamond Harbour creek, each to a depth of 82 feet, and a brick well, now in process of sinking, has reached a depth of 25 feet. The positions of the borings and well are shewn approximately on Drawing No. 1. The results generally shew a mixture of silt and sand in varying proportions. At the surface and towards the bottom of the borings the material has much the appearance of blue clay, whilst at the level of the bottom of the proposed dock wall (about 40 feet down) it contains a large preponderance of sand. In the first boring a good deal of water appeared to be present with the sand, and on visiting the works yesterday I found that the well at a distance of 120 feet from the boring had reached at a depth of 25 feet, a stratum of watery sand much the same apparently as that passed through by the boring. As seen through the better facilities afforded by the well, it appears at this point to be little better than a quick-sand. In borings Nos. 2 and 3 the sand was not in the same semi-liquid condition as was noticed in No. 1, and it is probable that, when the excavation is opened out on a large scale and suitable pumping power and other appliances brought to bear, no great difficulty will be experienced from this source. At the same time, the condition of affairs disclosed by the borings and well, should it prove to be alike over any considerable portion of the area, introduces an element of uncertainty as to the cost of at least one part of the contemplated works.

I think it is desirable that some further observations should be made during the approaching monsoon season to determine whether the oft-repeated objection to the dock, on the ground of its exposure towards the south-west, be well-grounded or not. I have already stated (appendix page iv)* that in my opinion the danger has been greatly over-estimated, chiefly from want of experience in the working of such docks, and in this I am confirmed, to a great extent by letters from the nautical men printed in the Appendix. This leads me to suggest that, if possible, any party deputed to make the observations should include three or four captains of merchant vessels, both sailing and steam, who have had general experience in different ports where wet-docks are in operation; and that, as a matter of detail, the direction and width of the two proposed entrances should be at the time conspicuously indicated by poles, easily recognized from the anchorage ground.

As the matter stands at present, there are two objections of more or less weight to the site suggested for the dock at Diamond Harbour—the state of the foundation, and the fact of its being on a lee shore during the monsoon. It appears to me that the Committee would be quite within their powers in suggesting the examination of an alternative site, which, though not actually at Diamond Harbour, is sufficiently near to be easily brought within reach of the railway.

A point about half way between Roychuck and Ramchunderpore, four and a half miles to the west of Diamond Harbour, whilst avoiding the James and Mary's and other dangers of the upper reaches, is less exposed during the monsoon, and appears to be generally well situated for the entrance to a dock. I would suggest that (1) any observations during the monsoon directed to Diamond Harbour should be extended also as far as Roychuck: (2) that a special survey of the surrounding district be made: and (3) that trial wells and borings be at once (before the rains) commenced on the site I have indicated on the accompanying plan. Should better results be obtained here than at Diamond Harbour, *i.e.*, should the firmer material be sound at a less depth, I should recommend it is generally the more desirable site of the two. The anchorage ground is not so wide as that off Diamond Harbour, but it is not a generally recognised anchoring place for vessels proceeding up or down, and no ships, except those intending to enter the dock, would as a rule bring up here. The Diamond Harbour Railway would of course be extended to the dock, but in addition to this, I would suggest the construction at an early date of a riverside line from the dock to Calcutta, taking in Fultah, Acheepore, Budge-Budge, Acra, and other places of importance. Such a line, passing through a populous manufacturing and trading district, would probably pay well, independently of any traffic from the dock.

On the accompanying river survey plan I have shewn approximately, subject to modification on the completion of the suggested survey, the site which appears to me to be the most suitable. The size of the dock, basin, locks, &c., and the details of locks, bund, storm-gates, &c., would be the same as at Diamond Harbour, and the boat canal suggested in my last could be as easily made to this point as to Diamond Harbour.

I ought to have mentioned in my former letter that the rates on which the estimates are founded were, after consulting several gentlemen of experience, fixed by me at an average of Rs. 16 per thousand cubic feet for excavation, including transport, with an addition of 25 per cent. for pumping, making Rs. 20 in all. The rate for ordinary brick-work was taken at Rs. 36, and for brick-work in cement at Rs. 50 per hundred cubic feet.

* Page 299.

Dated Calcutta, the 24th April 1882.

From—G. H. MORRISON, ESQ.,
To—THE HON'BLE H. J. REYNOLDS, C.S.,

President, Committee on Docks at Diamond Harbour.

As desired by you, I now beg leave to submit my views upon this question.

I yield to no member of the Committee in appreciation of the immense benefits that would result from docks well designed and well placed, but I do not think well of docks at Diamond Harbour—

1. Because we cannot confidently say that the channels between Diamond Harbour and the sea will admit of the free passage of vessels of the latest type, much less of the probable type of the future.
2. Because safe entrance into and egress from the docks will, during a sensible portion of the year, be questionable.
3. Because successful docks at Diamond Harbour would gravely prejudice Calcutta as a centre of trade and probably ultimately destroy it as a port.
4. Because there is reason to think that the interests of Bengal at large can be effectually provided for, not only without impoverishing, but by means which must greatly enrich its capital.

I will proceed to deal with these points *seriatim*.

1.—*Access to the Sea.*

In considering this point, I imagine that we must keep in view the requirements of the largest vessel which can pass the canal, viz. 26 feet draught; for if our river is closed to vessels which can visit other ports, we must be shut out from such cheapening of freights as developments in ship-building are calculated to effect.

The evidence before us is as follows:—

(*a*) Between Diamond Harbour and Saugor, since 1871, it has been necessary to change the route taken by vessels at least three times. After being in use for periods varying in length, each channel in turn has closed itself by throwing up a bar, and in none of the combined channels at any time has the depth of water been sufficient to allow a deep-laden ship to pass except towards the top of the flood.

(*b*) Saugor roads have distinctly deteriorated, so that it is now difficult to find safe anchorage for large vessels.

(*c*) The outer channels from Saugor to the sea are changeable and dangerous. The main channel—Gasper—has had 19 feet of water, reduced since 1870, but is noticed to be shoaling and narrowing. In 1853, 1854, 1855, soundings gave only 12 to 15 feet reduced, and on a patch only 10½ feet. It has been shown that if the Gasper were again to shoal to 16 feet, vessels drawing over 25 feet would be unable to pass during 71 days out of the first six months of the year, and vessels drawing over 26 feet would, during the same period, practically be excluded.

A glance at a good coloured chart of the Hooghly seems instructive. The "patchy," broken, and sinuous character of the deep water channels is very remarkable. Not one continuous!

It has been said that we have managed to get ships in and out for a hundred years: why not therefore for another hundred? Yes; but not habitually such ships as are now being built. We are at the point which allows no margin for development; any shoaling of our approaches or any step in advance by shipbuilders puts us out of the race.

It may be possible to improve our river or at least to protect it from deterioration; but, till satisfied that this is practicable, is it wise to spend two millions sterling on docks and warehouses, and to induce a large additional expenditure on railway works and other buildings, public and private; on water-works, sanitation, and all the needs of a township, which, if anything at all, will be an important settlement?

II.—Safe entrance and egress at all times is doubtful.

The preponderance of nautical evidence is, that in the S.-W. monsoon it will be a work of difficulty and danger to dock, whilst it will not be practicable at that season to provide safe anchorage for more than a limited number of vessels waiting to dock.

But *to wait* is to frustrate the very *raison d'être* of the dock.

It is said that at Sunderland the existence of a lee shore is not an obstacle to docking and undocking, unless under exceptional conditions of weather; but before accepting this as conclusive, I submit that it would be desirable to know more about the Sunderland docks, and to ascertain whether such weather as prevails at Diamond Harbour during the S.-W. monsoon is or is not sufficiently "exceptional" to interfere with docking.

III—Injury to Calcutta.

There is a notion that the docks will be, so to speak, an adjunct to, or suburb of, Calcutta. The London docks are instanced as in point, and it is asked why a run by rail should in India separate interests which in London are identical in spite of people using a train.

The answer is that the two cases are about as diverse as can well be imagined.

In the first place there is not to my knowledge any instance in the world of the two parts of one port being separated by a distance of 45 miles. To compare the aggregate of continuous townships, called London, with the snipe marshes between this place and Diamond Harbour surely suggests nothing but a contrast.

The incidents of trade at home are totally different from those that obtain here.

England practically exports nothing raw, for coal does not affect the present argument. The manufacturer submits his goods for approval before they are packed, and once packed they are not opened till at the foreign market. Thus there is little necessity for the merchant to visit the dock.

Here, on the contrary, we deal in the produce of the soil, and scarcely two lots offered to the merchant are quite alike.

Now, trade in this produce may take one of three channels.

To illustrate them let us fix attention on a buyer of wheat, &c., in the Cawnpore market—

1. He may sell to a Calcutta merchant who has chartered a vessel to take the wheat to England. Of course it is as easy for the Cawnpore man to send the wheat to Diamond Harbour as to Calcutta; but when the wheat arrives at the port, the merchant must be present to take it over, not only to see that justice has been done to him in respect of quality, but also to arrange with the ship those questions as to condition which are constantly arising. It will readily be seen that a merchant who has frequent transactions of this sort (that is to say, every merchant doing any considerable business) will be forced to have his representative permanently located at Diamond Harbour.

2. The Cawnpore man may refuse to sell his wheat, &c., at Cawnpore. In point of fact much wheat, &c., at present comes unsold to Calcutta; and that from many places. But if the ships are at Diamond Harbour it is evident that wheat sent to Diamond Harbour will save many intermediate charges to which wheat sent to Calcutta would be subjected. Thus by degrees a market will spring up around the docks which will be able to undersell the Calcutta market, and thus a further exodus from Calcutta of merchants and dealers will be brought about.

3. The Cawnpore man may establish connections in England and make his own arrangements for through freight. It is only in such a case that the presence at the dock of the Calcutta merchant will be unnecessary, but not to his own benefit.

General Import Trade.

The procedure is as follows:—

After examination at the ship's side for chafage or other damage, in respect of which there may be a claim on the ship, goods are removed to the merchant's godowns, where they remain a shorter or longer time according to the markets. They are then bought by dealers who distribute to the various marts of the interior.

Now, it is quite conceivable that the Railway Company, by accepting some rather risky responsibilities, and making some rather costly arrangements, might reconcile the Calcutta merchant to receiving his goods at a Calcutta railway station. It would, however, before long be found that by placing the centre of distribution at Diamond Harbour docks instead of at Calcutta, many expenses could be saved, and that merchants established there could undersell their Calcutta competitors.

The obvious result would be the gradual migration of another set of traders.

Salt is imported by merchants in entire cargo loads. It is, however, not usually sold by the cargo, but in small parcels, to many dealers, day by day. These dealers pay the duty, and each man brings his boat alongside the vessel and takes his salt. The Customs Preventive Service watch the discharge to secure the revenue; the merchant's clerk watches it to see that no man gets salt for which he has not paid; and the captain weighs out the salt to fix his freight.

The boats which carry this salt away into the interior are those which have brought produce down.

This trade could not be carried on from Diamond Harbour so long as merchants and dealers were here, nor so long as the salt was sent up-country by boats which have discharged in Calcutta. We have, however, seen that a produce market is likely to spring up about the docks, and as arrangements could be made to discharge ships' cargoes into bounded warehouses alongside the docks, and to deliver from bond direct into boat or railway wagon (whereby very great savings would be effected), it is certain that, sooner or later, the salt trade would leave Calcutta.

The coal trade would naturally follow the steamers.

Jute baling, now an important industry here, must of necessity place itself near the ships for the simple reason that the railways carry jute by weight, whilst the ship is paid freight by measurement. Hence the object is to bale it as short a time as possible before shipment, in order that the least possible re-expansion may take place before measurement for sea freight.

Marine Engineering.—Ship agency establishments and all the miscellaneous trades and industries dependent upon the custom of the ships are bound to move down the river.

Thus, the results of successful docks at Diamond Harbour must be the complete, though gradual, disintegration of many trades now pursued at Calcutta. It is indeed a

condition precedent to their success that they shall take from us nearly the half of the vessels that now come here, and we may safely say that the process of despoiliment of our shipping once begun, must continue, for when dock No 1 overflows, No. 2 will be excavated, and the "dockizable" space is practicably unlimited.

If these views as to trade are sound it follows that property in Calcutta generally, but particularly that very large portion which rests upon our present position as the chief port of Bengal, must suffer very serious deterioration.

IV.—Is this injury to Calcutta called for.

Of course if the expanding commerce of Bengal could not be provided for without sacrificing Calcutta we might have to accept the situation, but things have not yet come to this.

Various schemes have been propounded for increasing the resources of the present port by such expedients as extending the jetties to Garden Reach and utilizing the Howrah foreshore, &c, &c. They deserve careful consideration, but they are open to the serious objection that they leave untouched the delays and dangers of the Hooghly.

The same cannot, however, be said of Mr. Bruce's scheme to connect the Hooghly with the Mutlah by a ship canal; although, as regards the points of entrance into the respective rivers, his proposals might perhaps be modified with advantage.

Such a canal would be about 30 miles in length. The distance from Calcutta to sea by this route would be rather less than *viâ* Saugor, and according to the latest chart the least depth of water anywhere would be 22 feet reduced.

Comparatively speaking, not much appears to be known about the Mutlah beyond the facts that when last surveyed the channels were broad and deep and the water salt up to Port Canning. There seems, however, reason to look upon it rather as an arm of the sea than a river, and if so, there is little fear of its silting up or water failing.

The canal scheme would offer the following advantages:—

1. The dangers and delays of the Hooghly would be at once and for ever turned.
2. Vessels could proceed to sea at almost any time of any tide.
3. The navigation would be so easy that any steady seafaring man with local knowledge rapidly acquired could be trusted to pilot vessels in and out, so that pilotage charges would be susceptible of great reduction.
4. The port estate in which so much public and private money is invested would be safeguarded.
5. The organization of the Port Commissioners would be available for managing the canal and any docks connected therewith.
6. The extensive appliances now in the port might continue to be utilized, and further improvements might proceed without being checked by fear of their being superseded or rendered valueless by the creation of a rival port.
7. The revenues of canal (and docks) would go into one common purse, with jetty tolls and other port receipts, so that the surplus of one department would be available to cover any deficit in another.
8. The enormous cost of establishing a new town with its buildings, streets, lighting, conservancy, water, &c., would be avoided.
9. Property in Calcutta instead of deteriorating would be enhanced in value.
10. No interest (unless it were that of the present pilot establishment) would be assailed, and no man's business would be destroyed or violently disturbed, but the good of all would be promoted.
11. If the expense of constructing a dock as well as a canal were thought too great, the dock might be left for a subsequent undertaking. Meantime most of the advantages of docks would be secured by an enlargement or enlargements of the canal sufficient to allow of ships lying alongside a quay or jetty without impeding the navigation.

It has been objected that the project, however otherwise good, must be set aside by reason of its cost. It does not so strike me. I have already advanced certain considerations to the contrary, and may here point out that, through all but a short section of the canal, ground could be cheaply acquired. Near Calcutta any surplus land taken up would be re-sold at an enormous profit. The docks would in fact be the chief centre of business life, and land around them and on either side of the canal would be eagerly sought after for such purposes as—

Jute presses,	Petroleum stores,
Factories,	General warehouses,
Warehouses,	Inland steamer wharves,
Offices,	Emigration depôts,
Coal yards,	Timber yards,
Engineering shops,	Graving docks, &c., &c.

I propose, however, to show that such an undertaking, even though more costly than can reasonably be anticipated, would still be remunerative, and this may probably best be done by attempting an estimate of the gross savings which would result to the shipping and to the mercantile public.

To make the estimate intelligible, it should be explained that it is assumed that (either in docks or alongside quays or jetties) provision is made (*a*) for berthing every vessel that

enters the port; (*b*) for receiving her cargo at once into sheds or warehouses; (*c*) for loading such cargo out of sheds into boats or railway wagons or carts according to the destination of such cargo; (*d*) in other warehouses for receiving from boats or railway wagons a vessel's export cargo in advance, if need be, of her arrival; (*e*) and generally for proceeding uninterruptedly with discharge and loading. (It would be easy in dock to employ the electric light so as to work in the cool air of night, even better than by day.)

It is also assumed that trade would readily accommodate itself to the new conditions; that both imports and exports would be warehoused on the banks of the canal; that jute would be pressed there; that the railways inter-urban and external, the boat canals, the ship canal, and the docks would all be so connected and worked in harmony as to facilitate and cheapen to the utmost the movement of goods, and generally that such arrangements would be made as to eliminate the double carting and boating charges, which nearly all our imports and much of our exports have now to pay.

A.—Savings by Vessels.

It is estimated that the tonnage annually visiting this port will be not less than—

400	canal steamers.	The numbers for 1881 were ...	...	280
350	coasting steamers.	Do. do. ...	...	292
400	sailing ships.	Do. do. ..	...	462
1,150	vessels.	Total	...	1,034

Of these, the coaster could afford the least for dock or canal dues She now loads as rapidly in the stream as could be hoped for in dock, and her comparatively light draught minimizes detention.

	Rs.	Rs.	Rs.
She would, however, by using the canal save probably half a day, valued at ...	225		
And in pilotage,* say	400		
	625	× 350	= 2,18,750
The larger canal boat would save—			
1 day in the river, valued at ...	560		
2 days in loading and discharging	1,120		
In pilotage,* say	550		
	2,230	× 400	= 9,92,000

The sailing vessel would gain most of all.

Of the ships which came here in 1881—

40% were in ballast and averaged	33 days in port.	These could save	at least	20	days.
37% ,, salt laden ,,	49 ,,	,,	,,	29	,,
15% ,, with general cargo ,,	45 ,,	,,	,,	25	,,
8% ,, ,, coal ,,	40 ,,	,,	,,	20	,,

So that the average saving per ship in time might be 24 days.

	Rs.	Rs.	Rs.
24 days, at say, Rs. 200 ...	4,800		
Pilotage saved*	450		
Saving in tug hire, say ...	1,000		
	6,250	× 400	= 25,00,000
		Saving by ships ... Rs.	37,10,750

B.—Savings by Merchants on Boat and Cartage expenses.

	Rs.
SALT.—The imports now are over 300,000 tons, whereof about one-third has to be warehoused. Taking credit for only 10 per cent. increase in consumption, the saving in charges on the one-third portion bonded would be	1,40,000
COAL.—The saving would only be on the portion used by steamers, say, 100,000 tons, at Re. 1	1,00,000
GENERAL IMPORTS exclusive of salt and coal. (No figures showing the number of tons imported seem to be available.) I assume 500,000 tons, at Re. 1-12	8,75,000
JUTE.—Present export 334,385 tons. We may pretty safely reckon on an increase of export to 500,000 tons. Let us take the saving in charges at Re. 1-8, although, if the jute presses were located on the canal banks, the saving would be very much larger	7,50,000

* *Memo.*—If it were considered essential to maintain the present staff of Hooghly pilots, the saving in pilotage here shown (amounting in all to Rs. 5,40,000) could not be fully realized; but I believe that after a time it would be found unnecessary to maintain the Hooghly establishment.

	Rs.
GRAIN, SEEDS, &c., BROUGHT INTO CALCUTTA BY RAIL.—Mr. Leslie has shown that the East Indian Railway alone will bring in 1,250,000 tons. From all railways therefore let us say 1,500,000 tons, at Re. 1-8	22,50,000
OTHER PRODUCE NOT BROUGHT IN BY RAIL.—If stored in godowns on the canal bank, there would be large savings in cartage, boat hire, &c.; but let us say only	3,00,000
	81,25,750

If now we imagine the cost of land, canal, docks, and warehouses to amount to the surely excessive sum of 350 lakhs, the account will stand thus—

	Rs.	
Interest on 350 lakhs at 4 per cent.	14,00,000	
Maintenance, conservancy, and working staff, say ..	4,00,000	
Sinking fund, say	7,00,000	
Per annum		25,00,000
Balance available for lightening charges on shipping and on trade generally, after providing for deficit (if any) in the accounts of the Port Trust, viz., deficit caused by a falling off in receipts owing to transfer of business to the new docks ...		56,25,750

I need scarcely say that this is the roughest of estimates, and that it may probably need correction on both sides of the account. There are figures necessary for nearer estimates which are not available to me. The savings of trade have, however, not knowingly been overstated. On the contrary, present charges are not set down at their full amount per ton, nor have I included in the account such items of legitimate canal revenue as tolls on inland steamers, and other craft using the canals. Then, again, I have tried to put down the cost of the canal system, and of its maintenance, at figures not open to challenge, on the score of being too low, and I may have erred largely on the safer side. Lastly, I have not attempted to state the depreciation of property at Calcutta, which would follow upon the diversion of trade to Diamond Harbour; nor the rise in the value of such property which must naturally come about if we can succeed in preserving to Calcutta her character as the port and chief distributing centre for the whole of the rapidly-increasing commerce of Bengal.

I submit, however, that I have made out a *primâ facie* case in favour of Mr. Bruce's scheme; that such a project, commanding as it would the vote of the Calcutta interest, would pay more certainly and more rapidly than one which involves dragging merchants and dealers against their will away from this port; and that, at all events, we should advise Government to consider exhaustively the merits of the Mutlah and other alternatives before proceeding with the construction of docks at Diamond Harbour.

Dated 9, Victoria Chambers, Westminster, the 15th March 1882.

From—W. D. BRUCE, ESQ.,
To—The Vice-Chairman to the Port Commissioners.

I FIND among the papers submitted to the Commissioners at the 354th meeting a letter from the President of the Committee on Docks at Diamond Harbour, in which the Port Commissioners are requested to answer a series of questions relating to the Hooghly and the accommodation for the trade of port now available in Calcutta Most of the questions can best be answered by the pilots and merchants, but there are two (10 and 11) which, it seems to me, the Port Commissioners are in the best position to answer; and, with the view of assisting them in the discussion of these questions, I trust they will excuse my submitting to them the views which I now hold on this important subject. During the last twelve years that I have been connected with the Trust, the subject of port improvements has been constantly before my mind, and I feel now that I can speak with some confidence on the subject.

The first question (No. 10) runs as follows:—

"Having in view the probable increase of traffic on the Calcutta side of the river on the completion of the railway bridge over the Hooghly, do you think that the space now at the disposal of the Port Commissioners will be sufficient for wharfage and general accommodation?"

I am of opinion that it will not. But the present accommodation can be considerably increased, and will be used by a certain class of vessels, so long as they can get up the Hooghly to the Commissioners' wharves.

To increase the present accommodation I would, on the completion of the new railway bridge, remove the floating bridge from its present site to one immediately to the north of the Neemtollah Burning Ghat.

This would enable the Commissioners to lay down a large number of new moorings immediately abreast of the town and the East Indian Railway Company's premises in

Howrah, and save many vessels from the great inconvenience they are now put to by mooring them in Kidderpore and Garden Reach.

There would then be no obstruction between the shipping and the docks in Howrah, and vessels would be saved the expense to which they are now put when it is necessary for them to dock. On the completion of the railway bridge the bulk of the traffic will come direct to Calcutta, and the floating bridge can then be moved from the Armenian Ghat site to the site I indicate without inconvenience to the general public or the railway traffic.

The railway pontoon at Armenian Ghat can also be removed from its present site either to Howrah or to a site in front of the Commissioners' workshop at Meerbahar Ghat, if it is considered necessary to maintain the ferry in this position.

Another jetty could then be erected to the north of No. 1 jetty, and the whole frontage of the East Indian Railway Company in Howrah would be available for jetties should it be deemed advisable to erect such jetties for the loading of coal or other exports brought down by the railway for direct shipment. If an export trade in coal ever arises, the coal could be as easily shipped over jetties in this position as in the proposed docks at Diamond Harbour. To the south of the jetties, or between No. 8 and Chandpal Ghat, the accommodation for boat traffic is at present limited, and could not be encroached upon for the use of sea-going vessels without causing great inconvenience in the shipment of goods by cargo boats. The purchase of the Chandpal Ghat pumping station and the extension of the inland vessels wharf to Baboo Ghât will afford a certain amount of relief. But I can see no good reason for confining the boat traffic within these limits; the boat wharf might be extended without any inconvenience to the public, or encroaching on the drive, to the point opposite the north end of the carriage stand at the Eden Gardens, and, if this were allowed, another jetty might be constructed to the south of No. 8. This, with a new jetty north of No. 1, would give ten jetties for sea-going vessels, at eight of which vessels of 400 feet in length could be discharged.

This in my opinion is all that can be done to extend the accommodation on the Calcutta bank of the river abreast of the town, and it will not, when completed, provide for more than 250 or 260 general cargo vessels annually.

No wharfage accommodation can be provided for salt ships or to vessels employed in the coasting trade, and there is practically no river frontage available to provide accommodation for the increase in the trade of the port generally, except at Garden Reach, which is inconveniently suited for communication with the business quarters of Calcutta.

The next question then arises—

"If not, can you suggest any means of supplying the deficiency otherwise than by constructing the proposed docks?"

Docks at Diamond Harbour have often been proposed, but last, I believe, by Mr. Simms, nearly thirty years ago. He went fully into the subject, but nothing came of it, and it is my opinion that if they are carried out now they will prove as great a failure as Port Canning.

All experience has shown that it is most difficult to move a great and established centre of trade, and also that, while it is possible to bring ships within easy distance of the merchants, the merchants won't move to the ships. It will, no doubt, be argued that it is not intended to move the merchants from Calcutta to Diamond Harbour. The ships will stop there, but the goods are to be delivered by the railway in Calcutta, just as they are now delivered at the jetties; but such a system won't work. The merchant or his shipping clerk must be near the ship and in constant communication with those on board. Disputes as to breakage, damage by water, and short delivery are constantly arising, and have to be settled between the captain or agent of the ship and the consignees of the goods, and it would, it seems to me, be impossible for any cargo importer or exporter of goods to work with ships at Diamond Harbour without having an office on the spot, which would lead to extra expense, division of establishment, and interfere seriously with the conduct of business.

I have no doubt such reasons will be considered trivial objections to the scheme, but I have during the last twelve years seen so much of the worry and annoyance these disputes cause, even when working ships directly under the eye of the merchants, and I am certain they would lead to such serious detention or loss if the proper parties were not on the spot to settle them, that I feel convinced no ship will stop to discharge or load at Diamond Harbour so long as she can get up the Hooghly to Calcutta even at some little risk to herself. The question then arises, how can they best be provided with proper accommodation in Calcutta? The space available for moorings within easy distance of the business quarter of the town is limited, and I have already shown that only a very slight increase in the length of the wharves for sea-going vessels can be made on the Calcutta bank near the town without encroaching on the Maidan. Jetties or docks in Howrah will never answer when the East Indian Railway runs into Calcutta. The great bulk of the East Indian Railway traffic will leave Howrah when the bridge is completed, and whatever is done to facilitate the landing and shipping of goods must be done in connection with the railway system on the Calcutta bank of the river.

The space available for jetties or wharves on the river bank being limited, it seems quite certain that docks must sooner or later be constructed if the ships are to be brought within easy distance of the merchant offices. Many sites for docks have been proposed and reported on from time to time, but the site which seems to offer the greatest advantage, and which has been reported on most favourably, is that at Chitpore. Any site in Calcutta is, however, now objected to on the ground, apparently, that the James and Mary shoal will prevent

vessels of greater length and draft than those now running to come up to Calcutta; and that, looking to the probable increase in the size of vessels trading with Calcutta, docks for the accommodation of such vessels should be constructed at Diamond Harbour.

I quite agree with the proposers of this scheme in thinking that, in considering the question of extensive improvements for the shipping trade of Calcutta, the dangers and shoals of the Hooghly, likely to lead to any interruption of traffic, should be taken into account. But I cannot agree in the opinion that by establishing docks at Diamond Harbour the worst shoals or the greatest dangers in navigating the Hooghly will be avoided. The answers of the pilots to the first nine questions will, I hope, have convinced the Committee that the most changeable shoals in the Hooghly, and those most likely to interrupt traffic, lie between Diamond Harbour and the sea. Between Calcutta and Diamond Harbour the Hooghly is now practically in the same state as it was a hundred years ago. Changes take place annually in the James and Mary sands, but they are well understood, and pilots can guard against them. Below Diamond Harbour, in the Rangafullah channels, the case is very different. These channels are constantly changing, and in 1879-80 the Bellary channel—the only channel by which vessels could cross these sands—was rather worse than the James and Mary shoal. Hitherto it has generally been found that as one channel across these sands closed up another opened out; but a study of the charts showing the great and constant changes that take place between Culpee and Mud Point should, I think, convince the Committee that the closing of one channel need not necessarily be immediately followed by the opening of another, and that at any moment a bar might be thrown up which would cause a serious delay to (if it did not entirely prevent) the crossing of deeply laden vessels. The evidence collected by the Committee of 1853-54, and again by Mr. Leonard in 1864, all go to show that the chances of interruptions to traffic are greater below than above Diamond Harbour. The Committee that sat in 1854, in their report, divided the Hooghly channels into three classes:—1st, the stationary; 2nd, the fluctuating; and 3rd, the deteriorated; and then go on to say—"The portion of the river between Calcutta and Culpee may be considered to embrace all the channels of the first class, for though within it are found the dangerous and variable sands that lie between Fisherman's Point and Diamond Harbour, and the minor obstacles at Rayapoor and Mayapoor, yet there is an apparent permanence of character in the remainder of that section of the river which is not found lower down.

"The channels between Culpee and Kedgeree constitute the second or fluctuating class, and their changes are constant and rapid both in character and position." Below Kedgeree the report goes on to say that "the preponderance of evidence decides that they have deteriorated"

In the report submitted by Mr. Obbard, River Surveyor, on the condition of the Rangafullah channel between 1755 and 1836, he says—"December 1796. Outer channel so bad that ships of draught cannot use it, and inner so narrow that they cannot be laid across it to drop. Master-Attendant therefore recommends that none of the Company's ships be brought above Kedgeree."

It would be a serious matter if such an interruption to traffic occurred now. But the use of steam renders it possible for vessels to navigate narrow channels which without steam they dare not attempt. It would not therefore now necessarily follow that if the channels got into the same state that they were in 1796 there would be any interruption to the traffic; but I think it is a very significant fact, bearing on the general condition of these channels, that whereas in former years vessels of any draught could be brought up without steam, the pilots are now prohibited from taking any vessel drawing more than 21 feet either up or down the river without a tug.

Bearing all these facts in mind, it appears to me that the first question to be decided, when considering the question of improvements on the large scale now proposed, is whether all such improvements are to be left entirely at the mercy of the changing channels of the Hooghly, or whether it would not be advisable to have a second string to our bow and to connect Calcutta by a ship canal with the Mutlah. I am decidedly of opinion that the latter is the proper and wisest course to adopt. If docks are now to be constructed to meet the great increase in trade, which it is anticipated that the construction of new railway bridge will bring into Calcutta, such docks should be in a position to communicate either with the Mutlah or the Hooghly.

Docks at Diamond Harbour are just as likely to be cut off from communication with the sea as the port of Calcutta, and this fact alone is to my mind a sufficient reason against their construction, even were it probable that they would be used by vessels with cargoes for Calcutta, which I feel confident they would not, so long as such vessels even at some risk to themselves can get up to Calcutta.

My suggestion then to supply the deficiency in space otherwise than by the proposed docks at Diamond Harbour would be (1) to dredge a ship canal of the same section as the Suez Canal from the Mutlah to Sealdah; (2) to excavate a large dock on the east side of the railway in the position shown on the tracing which accompanies this letter; and (3) to connect this dock with the Hooghly by a cut joining the river at Ghitpore to the north of the present entrance to the canal. Vessels could then enter the dock either from the Hooghly or the Mutlah, and take berths either in the dock or at the jetties. The depth of water in the canal should be sufficient for vessels drawing 24 or 25 feet. Vessels could then proceed to sea by the Mutlah at any time of tide, there being sufficient water at all times from a

point on the Mutlah about five miles below Port Canning, where I propose the canal to start from to the sea.

To properly carry out this scheme, the Calcutta canals from the entrance lock at Dhappa to Chitpore should be made over to the Port Commissioners, and form part of the port of Calcutta. The Commissioners might recoup Government the expenditure recently incurred in improving the canals, and in return charge all boats discharging in the canal the same wharfage fees as are now charged on the inland vessels wharves in the Hooghly.

Boats that now pass through the canal to discharge on the river wharves pay all the canals dues and the port dues as well, and there seems no good reason why the boats discharging in the canal should not pay for the facilities they there receive. The revenue at present derived from the canals, and which is really paid for keeping open the communication through the Sunderbuns, would still be charged by Government and be available for improving the canals and channels which would remain under the Irrigation Department. The locked portion of the canal would then form part of the dock system I propose, and there would be free and easy communication between the boats in the canal and the vessels in the dock, as the water in the canals and in the dock would all be at the same level.

This is an outline of the works I would suggest to meet the future requirements of the trade of Calcutta. The proposed dock would be in the most convenient position for railway traffic and within easy distance of the merchants' offices, while the construction of the canal would render Calcutta for ever independent of the freaks of the Hooghly.

What the actual cost of the docks would be, I am not in a position to say, but they can be constructed in the position I have indicated as cheaply as at Diamand Harbour, while the actual outlay of capital on all the buildings and accessories, which it would be necessary to construct at Diamond Harbour, would be far greater than in Calcutta, where warehouses, water-supply, gas, and drainage already exist.

The cost of dredging the canal would be, I estimate, about £750,000. Interest on this sum at 4½ per cent. would be £35,750; and if to this is added £12,000 for annual repairs and dredging, the total cost of maintenance would be 4½ lakhs per annum. The saving in pilotage alone by the Mutlah route would cover a great part of this, and as the trade of Calcutta is gradually becoming a steam trade, there is practically very little necessity to consider the question of towage in connection with their proposed works.

The construction of docks would, I believe, tend very much to increase the number of steamers. If the Commissioners had proper arrangements for the discharge of salt steamers, they could then come out laden with salt. At present they cannot, as salt has to be discharged into boats and as the consignee requires it. So far the Commissioners derive no revenue whatever beyond mooring hire from any vessels trading to the port, except those bringing general cargoes. With a dock and greater facilities for loading vessels direct from the railway wagons, they would at once secure the landing and shipping charges from vessels employed in the salt trade and on the coast and China trades. There is therefore, it will be seen, ample room for a great extension of improved appliances without in any way encroaching on the revenue derived from improvements already constructed. But such further improvements should be made where they will afford the greatest conveniences to those employed in the trade of the port, and where they can form part of and utilize to a great extent the facilities which have already been provided—not in a position where, if they are used at all, they will be in opposition to the works already constructed, and where I believe they would never be profitable unless a great part of the trade of Calcutta, and the merchants who conduct it, removed to Diamond Harbour.

REPORT ON THE EXPERIMENTAL CULTIVATION OF CAROLINA PADDY IN KHORDA IN ORISSA.

THE following papers are published in the *Calcutta Gazette* for general information :—

No. 193, dated Cuttack, the 10th February 1883.

Memo. by A. SMITH, Esq., Commissioner of the Orissa Division.

COPY forwarded to the Secretary to the Government of Bengal, Financial Department (Agriculture), for information, in continuation of this office No. 887 of the 19th June 1882. The instructions solicited in paragraph 18 of Mr. Taylor's report as to the disposal of the paddy will be awaited.

2. The samples of the paddy noted in paragraph 17 are transmitted in a separate packet.

No. 9, dated Khoorda, the 22nd January 1883.

From—W. C. TAYLOR, Esq., Settlement Officer,
To—The Commissioner of the Orissa Division.

IN continuation of my No. 251 of the 31st May last, I have the honour to report the result during the past season of experimental cultivation of the so-called Corolina paddy from Ceylon, forwarded by the Government of India for trial in Khoorda.

2. As stated in my last letter, only two seers of good seed were obtained from the half seer of seed originally received

3. After keeping a sample of the first year's produce for comparison, I treated the rest, nearly two seers, as follows.

4. Nearly one seer was sown broadcast on the 2nd June 1882 on 3,000 square feet of 13″ class single-cropped dhan land. After the land had been ploughed up twice, and as the place was near an irrigation dam, and in the line of drainage where it would receive washings from the high land, I gave no manure in order to check over luxuriance of growth.

5. This dhan germinated a little slower than the dhan of indigenous varieties in the surrounding fields, but when up, it continued to grow very well, and produced remarkably strong healthy plants, which were bushy and of a dark green colour with very stout straw.

6. On the 15th July the crop was puddled by passing the plough through and through it, after the local fashion called *bebasan*. This had the effect of killing most of the grass and weeds, and when the plants stood up again and began to grow, it was weeded (called *bacha*), and the plants where too thick were thinned out, and replanted where too thin, called (*khela*). This was at the end of July.

7. After the *bacha khela* nothing was done, except one weeding to the crop through which there was a constant flow of water night and day which, owing to the swampy nature of the soil, could not be cut off, as I should have liked doing occasionally.

8. This constant flow of water and the washings from the high land caused the plants to become too large and leafy, and although the grain ripened by about the middle of November, I was not able to cut it until the 29th of that month, and even then the straw was quite green.

9. The outturn from this experiment weighed, after it was thoroughly dried, 60½ seers, the whole of which I have preserved.

10. With the other half of last year's seed I tried the planting out system called *ruâ*

The seed, a little less than one seer, was sown in a seed bed, well manured, on the 16th June 1882.

The plants were taken up and planted out on the 5th August last on 2,500 square feet of 13″ class single-cropped dhan land, which had been previously puddled and prepared for them.

11. This land also was commanded by irrigation from the dam mentioned above, and also from another spring, but the soil was different. The plants grew well, though not so luxuriantly as in No. 1 experiment. They were twice weeded, and were frequently irrigated; the grain was ripe and the straw dry by the 15th November, but owing to press of other work the dhan was not cut until the 23rd. The outturn, when dry, weighed 52 seers, but two or three seers must have been lost, as I saw a good deal of grain lying in the field which had been eaten by rats.

12. From the above, it will be seen that from the two seers of seed obtained by me from the experiment made in 1881, I have obtained 112½ seers of good seed, or about fifty-six fold, or at the rate of about 22½ maunds of dhan to the acre.

13. The total weight of the straw, when thoroughly dried, was 211 seers of 80 tolahs, or at the rate of more than 40 maunds to the acre.

14. This sample of paddy I find comprises four varieties; they are all coarse rice, but the plants are strong and the yield very fair, and I have been asked for seed by several ryots.

15. I am now trying to grow a small field or two of this paddy as a spring crop, and will report the result in due course.

16. This "Carolina paddy" is totally different from any of the many varieties of "Carolina paddy" before reported on by me, and I very much doubt its being Carolina paddy at all.

17. In conclusion, I beg to enclose small samples as follows:—

No. 1. Sample of the two seers seed obtained in 1881.

" 2.
" 3. } Samples of the dhan grown in 1882 showing the four varieties contained in
" 4. } the seed obtained from Government of India in 1880.
" 5.

18. Instructions are solicited as to the disposal of the seed obtained. I can spare about two maunds; the cost will be Rs. 5, which will quite satisfy the cultivators who worked the experiment under my supervision. The rest of the seed I should like to keep for distribution and further experiments.

ADMISSION INTO THE SUBORDINATE EXECUTIVE SERVICE.

APPOINTMENT DEPARTMENT.

Dated Calcutta, the 23rd February 1883.

RESOLUTION.

THE Lieutenant-Governor has for some time past been of opinion that the system under which the Subordinate Executive Service in these Provinces is at present recruited is not satisfactory, inasmuch as it affords Government no sufficient means of estimating the qualifications of the candidates for employment. Changes in this system have from time to time been made, and the following statement gives succinctly a history of the subject:—

2. In 1868, Sir William Grey, as Lieutenant-Governor, introduced a plan under which candidates were appointed to the Subordinate Executive Service partly by nomination and partly by the results of a competitive examination. The object of the examination was to test the general education and intelligence of the candidates, as well as their knowledge of English and of one of the vernacular languages of these Provinces. The candidates were required to compose an English and a vernacular essay, and to answer questions on general subjects. The first examination was held on the 26th May 1868. Sixty-nine persons were admitted to it, and 12 European and 18 native candidates were selected for appointment. Upwards of 2½ years elapsed before the last of these persons could be provided with appointments, and in consequence no more examinations were held during Sir William Grey's administration.

3. In 1871, Sir George Campbell, who succeeded Sir William Grey as Lieutenant-Governor, declared his intention of establishing a system of examination for candidates for appointment to the Subordinate Executive Service. Rules for the examination, dated the 26th September and 3rd October 1871, were duly published in the *Calcutta Gazette*. In 1872 these rules were so far modified that every candidate was required to produce a certificate of character, a health certificate, and another certificate showing that he was able to ride 12 miles at a rapid pace or walk 12 miles within three and a half hours. Persons who could produce these certificates were required to pass a preliminary examination in English, unless they had passed a University Examination, in which case they were exempted from the preliminary examination. An examination (1) in the Vernacular, and (2) in Drawing, Surveying, and Engineering was compulsory on all candidates. Examinations in Law, Elementary Botany and Chemistry, and Gymnastics were optional, with the reservation that no one who failed in Law could get an appointment on a salary over Rs. 100, and that no one who failed in Chemistry and Botany could be appointed to the Opium Department. At the examination held in February 1872, nine European and 37 native candidates presented themselves for examination. Of these 17 were declared to be eligible for appointment to the Subordinate Executive Service. Under the revised rules issued for the examination of 1873, two classes of appointments were thrown open to competitive examination—one on a salary of Rs. 100 per mensem and upwards, and the other on salaries of less than Rs. 100. At the examination held in January 1873, 238 candidates appeared, of whom 123 competed for the higher and 115 for the lower class of appointments. Of these 58 candidates passed for the higher and 86

for the lower grade. In the rules for the Native Civil Service Examination for 1874, it was declared that all appointments in the Subordinate Executive Service, and all posts of Rs 50 and upwards in the sub-divisional establishments, both in the regulation and in the non-regulation districts, would ordinarily be reserved for persons who passed the Native Civil Service Examination.

4. In 1874, out of 423 candidates who obtained permission to present themselves for examination, 285 actually appeared and were examined. Of these 67 were declared to have passed in the higher and 133 in the lower grade. The first three examinations held in Sir George Campbell's time thus rendered 361 men eligible for appointments. The deputation to sub-divisions of sub-executive officers, however, enabled the Government to secure appointments for almost all those who passed the first two examinations, while the operations for the relief of the famine in 1874 afforded the opportunity of employing temporarily a considerable number of those who passed the examination in that year. The number of the officers who had been selected was, however, largely in excess of the ordinary requirements of the service. The resolution, therefore, reviewing the results of the examination of 1874, stated that it had been decided to raise the standard of proficiency with a view to reducing the number of candidates likely to present themselves for examination. Accordingly, at the examination held in February and March 1875, the candidates were required to obtain two-thirds of the marks in each subject, to entitle them to be passed by the higher standard, and one-half marks in each subject to be passed by the lower standard. Ninety-two candidates were permitted to appear at the examination, but 78 only went through it. Of these, five were declared to have passed the higher grade and 15 the lower grade. In the resolution on the results of the examination of 1875, it was stated that about 80 passed candidates had to be provided with higher grade, and 120 with lower grade appointments, and that in consideration of this large number of passed candidates, no further examination would be held until further notice.

5. Subsequently, in a minute dated the 25th September 1875, Sir Richard Temple reviewed the principle on which examinations had been previously conducted, and pointed out that it had resulted in the passing of a larger number of candidates who came up to a given standard, than could be provided for in any reasonable time. He therefore decided that in future the number of places in the higher and the lower class to be competed for should be fixed, and that they should be allotted to the corresponding number of candidates who stood first at the examination, and that for those who were thus passed employment would be found. The rules for the examination, published under date the 23rd November 1875, were not otherwise materially altered, but candidates passed at any previous examination were permitted to appear at the examination under the revised rules in the grade in which they had previously passed. The number of places offered for competition was four in the higher and seven in the lower grade. As, however, the rules had not been made public sufficiently early in the year to afford candidates much time for preparation, the number of candidates who appeared at the examination held in 1876 was less than the number of appointments offered. Only eight candidates appeared, of whom two were declared eligible for appointments in the higher grade, and four for appointments in the lower grade. In November 1876 a notification was published declaring that of the candidates who might present themselves for examination in 1877, four would be selected and declared eligible to hold first class appointments, and six to hold second class appointments, the places being awarded to candidates according to their order of merit in the examination, provided that none would be selected for a vacancy in the higher class of appointments unless he obtained at least two-thirds, or for one in the lower class, at least half, of the total number of marks obtainable upon the whole examination. Thirteen candidates appeared at the examination held in March 1877, ten for the higher and three for the lower grade, but none were successful in the former, but the three who went up for the lower grade were declared to have passed.

6. Sir Ashley Eden, who succeeded Sir Richard Temple, considered that the competitive system of examination had been a failure, and he adopted the system at present in force, under which the names of candidates

who appear from their position, training, and educational acquirements to be persons eligible for appointment either as Deputy Magistrates and Deputy Collectors, or as Sub-Deputy Collectors, are entered in two registers, and from amongst the names so entered a selection is made on the occurrence of a vacancy. At the present time both lists contain a large number of names, some of which have been on the registers for many years. Partly owing to this fact, and partly because the qualifications of the candidates were not always fully recorded, the information which the Government now has on this point is not sufficient to ensure a satisfactory selection. The object in view is to obtain the best men for the public service. No mere system of examination as regards educational qualifications is sufficient for this purpose, and the Lieutenant-Governor's desire is to combine with educational tests some practical experience of fitness for the official work which falls to the lot of officers of this class. In the Subordinate Judicial Service no person is appointed a Moonsiff who has not, besides the attainment of a B. L. degree, shown his aptitude for judicial duty by a three years' training as a pleader in the judicial courts; and some arrangement of a similar kind is necessary to secure efficiency in men selected for the executive work under Government. Mr. Rivers Thompson has therefore determined on gradually introducing a system under which appointments to the Subordinate Executive Service as Deputy Magistrates and Deputy Collectors shall again be thrown open to competition. To meet the claims of those who, under the nomination system, have been waiting their turn for appointment, all vacancies during the current year (1883) will be filled by candidates now borne on the Government lists. In January 1884, those on the lists who have not succeeded in getting an appointment will be, together with the men in the first and second grades of Sub-Deputy Collectors, allowed to compete for the appointments that will fall vacant in that year. In January 1885, all appointments in the Subordinate Executive Service will be thrown open to public competition. Two months previous to the examination to be thus held, notice will be given as to the number of vacancies expected during the ensuing year, and these vacancies, as they occur, will be filled up according to the results of the examination. Ordinarily there are six or seven substantive vacancies in the year.

7. The examinations of January 1885 and subsequent years will be open to all natives of India, including Eurasians, who have passed the Entrance Examination of the Calcutta University, who can produce certificates of health, respectability and good moral character, and who are not more than 25 years of age. Each candidate will pay a fee of Rs. 10 to cover the expenses of examination, and applications to be allowed to appear at it, accompanied by the fee and the necessary certificates, must be sent not later than the 1st December in each year to the Under-Secretary in the Appointment Department, or to such other person as the Lieutenant-Governor may appoint. To those whose applications are rejected the fee will be returned. For the examination to be held next January a fee of Rs. 5 will be charged, and intimation of intention to appear at it must be sent in to the Under-Secretary not later than the 1st of December next. It must be distinctly understood that at this examination only those persons whose names are now entered in the list of registered candidates, or who hold appointments in the first or second grades of Sub-Deputy Collectors, will be allowed to compete. Henceforward no fresh names will be added to the existing list of candidates. Particulars as to the subjects and standard of examination will be published hereafter.

8. So far as regards the competitive examinations. It remains to consider what plan shall be adopted for the training of the candidates who have succeeded according to the number of vacancies assigned, after the examination. The Lieutenant-Governor proposes to attach them at once to different duties in districts. They may be usefully employed as subordinates to the Personal Assistants of Commissioners of Divisions, as Assistants to Managers of Government and Wards' estates, as Assistants to Superintendents of Surveys and Settlements, or in any other capacity where they will have an opportunity of learning the practical duties of every day work which belongs to the Subordinate Executive Service. During such employment they will be

regarded as probationers, and their eventual appointment to a substantive post will depend upon the manner in which they discharge their duties. Until they obtain a substantive appointment, they will receive a small subsistence allowance of Rs. 50 per mensem. In ordinary course all such probationers would be absorbed into the regular service in twelve months from the time of passing the examination.

9. These proposals apply only to persons seeking the appointment of Deputy Magistrate and Deputy Collector. Sub-Deputy Collectors form an entirely distinct class, and have no claim by right to promotion to the superior grade in the Subordinate Executive Service, though it will be open to them to obtain it through the system of examination now contemplated. The Government, however, reserves to itself the right, under special circumstances, of rewarding meritorious services by direct appointment or by promotion.

ORDER.—Ordered that a copy of this Resolution be forwarded to all Commissioners of Divisions for information and for communication to the District Officers.

Ordered also that a copy of this Resolution be published in the *Calcutta Gazette*.

By order of the Lieutenant-Governor of Bengal,

F. B. PEACOCK,
Offg. Secretary to the Govt. of Bengal.

PUBNA RIOT CASE.

Dated Calcutta, the 27th February 1883.

From—F. B. PEACOCK, ESQ., Officiating Secretary to the Government of Bengal, Judicial, Political, and Appointment Departments,

To—The Commissioner of the Rajshahye and Cooch Behar Division.

I AM directed to acknowledge the receipt of Mr. Metcalfe's letter No. 2J, dated 16th January last, submitting his report on the serious case of rioting which occurred at Dulai, in the district of Pubna, on the 10th December last. The occurrence was first reported by you to Government on the 20th December, and Mr. Metcalfe, who shortly afterwards was appointed to act for you during your absence on leave, was requested by the Lieutenant-Governor to proceed to Pubna, and submit a further report on the case, giving the result of the proceedings in the Magistrate's Court against the accused. This report he has submitted with his letter under acknowledgment, and the Government has been put in possession of the entire facts of the case. The Lieutenant-Governor, however, considered it advisable to reserve his remarks upon the case until the decision of the appeal pending before the Sessions Judge of the 24-Pergunnahs, who has now upheld the conviction, though he has modified the orders of the Magistrate.

2. The present occurrence is the latest outcome of the litigation in which Azeem Chowdhury, the zemindar of Dulai, has been involved for more than twenty years in connection with his first wife's claim to the dowry promised to her on marriage. The original suit for the dowry was instituted before 1860 in the Court of the Subordinate Judge of Furreedpore. It was dismissed by the Subordinate Judge, but was decreed by the High Court on appeal, and this decree was subsequently confirmed by the Privy Council in 1876-77. Another suit was then instituted for the mesne profit of the estates decreed. This case also was decided in favour of the wife by the High Court, and the decision was upheld by the Privy Council in 1881. Before the termination of the first suit, the wife having had to borrow money from Mr. N. Pogose of Dacca, sold him the High Court's decree in satisfaction of her debt. Mr. Pogose, however, died before the litigation was finally concluded, and his estate came under the control of the Official Assignee, who appointed Mr. Brae as his agent. This gentleman appears to have since been engaged in enforcing the decrees, and, notwithstanding the most persistent resistance on the part of Azeem Chowdhury, by the commencement of December last the latter's estates had been sold, and an order had been issued by the Judge for

the attachment of all his remaining property at Dulai, consisting of his residence, cash and furniture, and for his arrest.

3. It appears that Azeem Chowdhury had in his possession promissory notes of the value of several lakhs, which he had some years before endorsed in favour of his son by his second wife, for the purpose of avoiding their attachment in execution of the first decree. These, however, he was unable to negotiate without his son's consent, and the ill-feeling existing between them prevented any arrangement being made on the subject. It appears from the Magistrate's memorandum, quoted in the report, that an effort was made by him in September last to effect an agreement between the father and the son, with the view of disposing of some of the notes for the payment of the money decreed. Mr. Barrow had an interview with them at Pubna; but, although he had reason to hope at the time that the advice which he then gave them would lead to a settlement of the decrees, no such result followed. The dispute between Azeem Chowdhury and his son continued, and the Magistrate found it necessary to make special police arrangements for the preservation of peace in Dulai and the neighbourhood.

4. In November Mr. Brae obtained the order for the attachment of Azeem Chowdhury's house, which resulted eventually in the serious rioting under notice. He applied to the Magistrate for police assistance to carry out the order, but this was refused, and he was referred to the Civil Court. The Lieutenant-Governor approves of Mr. Barrow's action in thus declining to place any police at the disposal of the decree-holder without a request from the Civil Court, and considers that the orders which he issued on the occasion were judicious and sufficient. Eventually the Naib Nazir of the Court, who was deputed to attach the house, was resisted in a formal way by some of Azeem Chowdhury's men, and abandoned further proceedings. The Judge thereupon sanctioned the prosecution of the men who had opposed him, and also requested the Magistrate to direct the police to give proper protection to the Nazir, who was now deputed to deliver possession of the house to Mr. Brae and to arrest Azeem Chowdhury. The Magistrate accordingly issued warrants against the men accused of resisting the Naib Nazir, and directed the Inspector and subsequently the District Superintendent himself to accompany the Nazir with a force of constables, and support him in the execution of his duty. Such, briefly, is the history of the case up to the day of the rioting.

5. The Lieutenant-Governor has no desire to enter into the family concerns of Azeem Chowdhury, but it is clear that the discord which prevailed in his household led him into difficulties, not so much of a pecuniary as of a domestic character; and that, though able from the money at his command to satisfy the decrees against him, he preferred, apparently from animosity to his first wife, to resist the execution of the decrees by every means in his power. Probably if the decrees had not come into the hands of the Official Assignee, Azeem Chowdhury's pertinacity in resistance to the law would have been successful for a much longer period. As it was, notwithstanding earnest endeavours on the part of the Magistrate to adjust the differences between the father and son, the former remained obdurate and refused a settlement which he had ample means to effect peaceably. He still resisted the attachment of his house, and, when after a first successful show of opposition, he learnt that the Judge's officers were coming under the protection of the police, he made arrangements of a formidable character to prevent them from obtaining access to it and so fulfilling the duty to which they were deputed at the instance of the Civil Court.

6. What occurred when the Nazir proceeded to the house with the police on the 10th December is described in detail in Mr. Metcalfe's report. He was accompanied by Mr. Rattray, the District Superintendent, Mr. Brae, and the Sub-Registrar of Dulai, who was specially requested by Mr. Rattray to go with them. The police force consisted of the Inspector, a Sub-Inspector, two head constables and 18 constables, of whom six only were armed with muskets. Before starting, the District Superintendent, having heard of the preparations made for resistance, sent a warning to Azeem Chowdhury that the police would fire if attacked. The party were met at the entrance to the premises by a number of unarmed men, out of whom a few

respectable persons came forward and entreated the District Superintendent not to proceed, as they feared there would be bloodshed, and he would be killed. Mr. Rattray, however, explained the circumstances which rendered the presence of the police necessary, and pushed on. A clubman then rushed unarmed among the police and was knocked down, whereupon a number of men with spears and sticks advanced, shouting and yelling in a threatening and defiant manner. The constables were then directed to load in the presence of these men, and to continue their advance. They were, however, assailed with brickbats and other missiles, and being confronted by a large number of men armed with spears, and seeing others similarly armed crowding the balcony and terrace above, several of them fell back among the crowd, leaving only four men with the District Superintendent. As the rioters again advanced, Mr. Rattray took his gun from his orderly and fired a charge of snipe-shot at their legs. The party aimed at retreated behind a wall, but another party rushed forward, and Mr. Rattray fired his second barrel. At this moment, without any orders from the District Superintendent, four shots were fired by the constables who had fallen back, and who, it is stated, would not advance on account of the brickbats thrown at them. The clubmen then ran inside the house and closed the door, blocking it up with timber and bales of jute, and the police took shelter under the balcony.

7. A party of men subsequently came forward to endeavour to arrange terms between Azeem Chowdhury and Mr. Brae, and while these discussions were going on, the police moved to the entrance to the premises. The negotiations failed; and, late in the afternoon, the premises having in the meantime been vacated by the rioters, the doors were taken off their hinges or broken down, and the Nazir entered and attached all the property found in the house, amongst which were three chests of money, containing no less than Rs. 1,29,000. In one of the courtyards two men were found wounded, who stated that they had been shot by the police. One had a bullet wound in his body, and has since died. The other, who was wounded by a bullet through the fleshy part of the leg, has, it seems, recovered under treatment in hospital. There were also found on the premises 15 swords, 16 spears, three guns (one of which was loaded), a great number of sticks, and some bows and arrows.

8. Two days after Azeem Chowdhury was arrested by the Magistrate in a mat house adjoining his own, which was included in the Civil Court decree, and there is apparently no reason to doubt that he was actually on the premises when the resistance was offered to the police. He was subsequently tried and convicted of abetment of resistance to the taking of property by the lawful authority of a public servant, of employing or conniving at the employment of persons to commit rioting with deadly weapons, and of abetting such rioting, and sentenced to six months' imprisonment and fines aggregating Rs. 3,000. The Judge of the 24-Pergunnahs, to whom the appeal was transferred as the offence had been committed in contempt of the order of the local Judge, has modified the finding and sentence, convicting the accused of not having, as the owner or occupier of the premises for whose benefit the rioting with deadly weapons was committed, used the means in his power to prevent such rioting, and sentencing him to a fine of Rs. 2,000.

9. Mr. Rivers Thompson refrains from entering into any discussion of the judicial decisions in the case. He deems it sufficient to note that the Appellate Court has found that an offence of rioting with deadly weapons, which is punishable with imprisonment extending to three years, was committed, and that Azeem Chowdhury, though technically not liable to punishment for the rioting itself, was responsible for that offence. The Lieutenant-Governor's immediate concern is with the conduct of the police in respect to the firing on the rioters, and on that point, after the most careful and anxious consideration of the circumstances of the case, he feels bound to record his opinion that the police cannot be censured, and that the responsibility for the death of the unfortunate man who was shot rests entirely with those who, after a protracted defiance of the law through a long series of years, eventually organized armed resistance to the execution of the Civil Court's orders. The police did not proceed to the spot unlawfully, but under proper and legal authority: Azeem Chowdhury and his men were quite well aware that the police were supporting the Nazir at the request of the Judge; and the District Superintendent had taken

the precaution of warning them before starting for the house that, if attacked, the police would fire upon their assailants. Nevertheless, when the police arrived, there was no indication of any intention on the part of Azeem Chowdhury to abandon his determination to resist the law. The District Superintendent was, on the contrary, told at the entrance to the premises that there would be bloodshed if he entered; and when the police moved on, as they were bound to do, they found themselves confronted, threatened and attacked by a large body of armed men, reported to have exceeded 250 in number. The District Superintendent's attempts to frighten the rioters, first, by ordering the police to load in their presence, and next, by discharging his gun, loaded with small shot, proved unavailing, and it was at this stage that some of the constables fired. The Lieutenant-Governor, while deploring the loss of life which resulted, cannot, under these circumstances, condemn the police for having used their arms. The notoriously lawless character of Azeem Chowdhury, the remark of his men to the District Superintendent at the entrance to the premises, the crowds of armed retainers inside, and their aggressive movements, were quite sufficient to show that a determined and desperate resistance was intended, and that even for self-defence only they must meet force with force. It is easy enough to criticise the conduct of the police at a distance, and to contend, as the Lieutenant-Governor has seen it contended, that the resistance offered was no sufficient justification of the course adopted by them. If a continuous and deliberate opposition to the execution of the law is to be allowed to prevail, the criticism may be justified. But the police here were brought into a great difficulty, not of their own choosing, by the violent acts of a man who, from his position in the district, should have been on the side of obedience and order. The alternative before Mr. Rattray was either to recede from the duty imposed upon him (which certainly would have involved censure and punishment), or to break down the opposition; and he rightly, in the Lieutenant-Governor's judgment, chose the latter. The regular enforcement of legal claims is as fundamental a policy of good civil administration as the maintenance of the peace. Both were in jeopardy here, at the instance of a leading zemindar from whom the Government had a right to expect support and not hostility; and the only regret is that the exact technicalities of the law have rendered any mitigation of the primary sentence necessary.

10. In paragraph 43 of his report, Mr. Metcalfe raises the question whether the Magistrate should not himself have gone with the Civil Court officers and taken a larger force of police. It appears, however, that the force sent consisted of all the men in the reserve but three, and that a responsible officer was sent in charge of them. The Lieutenant-Governor does not think that any blame attaches to Mr. Barrow either on one point or the other.

11. I am to request that the result of the proceedings against the other men arrested for complicity in the rioting may be communicated in due course for the information of Government.

No. 2J, dated Pubna, the 16th January 1883.

From—C. T. METCALFE, ESQ., C.S.I., Offg. Commissioner of the Rajshahye and Cooch Behar Division,

To—The Secretary to the Government of Bengal, Judicial Department.

IN accordance with the instructions contained in your letter No. 3831J, dated 30th December 1882, I have visited Pubna, and in continuation of my letter No. 1J, dated 3rd January 1883, informing you of the result of the criminal proceedings taken against Azeemuddin Choudhury, I have now the honour to submit the report called for on the very serious riot which occurred in the village of Dulai on Sunday, the 10th December last.

2. I have visited the locality 23 miles from Pubna, and have had an opportunity of becoming acquainted with the position occupied by the different parties; also of ascertaining the previous civil litigation, as also of the particulars of the resistance offered to the Civil Court Nazir.

3. The history of the litigation which has ruined Azeem Choudhury, and led up to the present case, may be prefaced by a narrative of his family history.

Fakeeruddin Mahomed Asan Choudhury, *alias* Azeem Choudhury, is a son of Munshi Rahimuddin, Meer-Munshi of the Nattore Court, and subsequently Sheristadar of the Rajshahye Court. He amassed a large fortune, bought estates in the year 1219B.S., *i. e.* 70 years age, and built a Musjid and other buildings. Azeem was his sole heir. His forefathers had been at Dulai for many generations, and were poor, and not of any note.

The case of Munshi Rahimuddin is to this day quoted among the natives as an instance of the very large fortunes formerly made by natives in the service of Government. With the fortune realized, he dug a very wide quadrangular moat, and erected a large masonry pile of buildings consisting of two double-storied houses connected by high walls concealing four interior courtyards, which again have double storied rooms constructed around them. The various parts of the house are reached by private staircases concealed in the thickness of the walls. The interior courtyards are reached only through dark and narrow passages. The exterior walls of the buildings enclose walled gardens with masonry tanks and privies for the use of the females of the establishment. The buildings are of a very substantial character, and strong gates protect the entrances to the several parts of the house. The two larger houses facing the main entrance have overhanging balconies. The main courtyard is entered through high gates under an arch. With this stronghold Azeem Choudhury inherited 18 large revenue-paying estates in Pubna, yielding a gross rental of Rs. 90,733 in accordance with former rent-rolls, besides other estates in Rajshahye, Bogra, and Furreedpore.

4. He married many years ago the daughter of a respectable zemindar of Singha in Goalundo, by name Bala Meah. Azeem Choudhury by this wife had one son, Ahmed Jan, and two daughters. Before his marriage with this lady (Mussamat Najumanessa Choudhurain) he executed a deed of kabeennama (dowry) under which his wife was entitled to a half-share in his estates. Some time after this marriage, Azeem contracted a second marriage (*nika*) with an Armenian lady of Dacca. In consequence of this second marriage discord arose in the family, the particulars of which it is not necessary to describe; and eventually the wife instituted a suit in the Furreedpore Subordinate Judge's Court on the kabeennama, the original of which was filed with the plaint, but the plaintiff kept a certified copy. During the pending of the suit the original document was stolen and removed from the record. An official enquiry was held, and the whole of the Subordinate Judge's amlah dismissed. This occurred, so far as I can ascertain, in 1858.

5. The Subordinate Judge dismissed the plaintiff's suit, but on an appeal to the High Court the case was decreed to the plaintiff, and that decree was subsequently confirmed by the Privy Council about 1876-77.

6. The original decree was for a small sum, but Azeem Choudhury, although well able to pay up the amount, refused to do so through sheer obstinacy, and allowed the decree of the High Court to run on at 12 per cent. interest, hoping the decision of the Privy Council might be in his favour.

7. To enable her to defend her decree both before the High Court and the Privy Council, Mussamat Najumanessa Choudhurain borrowed money from Mr. N. Pogose of Dacca, and sold him the decree in payment of her debt.

8. This suit for declaration and possession on the kabeennama was instituted in 1858, and was decided about 1878. A second suit was then instituted for mesne profits of the estates decreed by the Privy Council, which suit was decreed both by the High Court and the Privy Council in favour of Mussamat Najumanessa. The decision of the Privy Council was given in 1881.

9. During the pendency of these suits, Mr. N. Pogose had died, and his estate came into the hands of the Official Assignee in Calcutta, who appointed Mr. Brae as his agent.

Although Azeem Choudhury might at any time during the last 20 years have settled the claims against him for a comparatively small sum of money, he has persistently fought, step by step, and availed himself of every device to delay the payment of the Civil Court decrees.

10. His conduct shews that, although possessed of large sums of ready cash, quite sufficient to satisfy his creditors, he has deliberately allowed every part of his landed property to be sold, bit by bit, rather than unbend in any degree and satisfy his creditors.

11. Some time about 1873-74, fearing lest the promissory notes which he held might be attached in satisfaction of the Civil Court decree, he endorsed them over to his son Hyder Jan, the son of the Armenian Jewess previously referred to. Further, to escape arrest himself, Azeem left Dulai and took refuge in Chandernagore, leaving his son in charge of his house and property.

I am informed that the father charges his son with having taken advantage of this trust and confidence to possess himself of money from the father's treasury to buy back his father's estates, which were then being sold for satisfaction of the Civil Court decrees. After purchase the son claimed the estates as his own. Hitherto the father had allowed his son Rs. 75 a month for maintenance. He discontinued the allowance and swore eternal enmity to his son. The son retaliated by claiming the promissory notes which had been endorsed to him to save them from attachment; but as the securities were with the father, neither father nor son could draw the interest, which has never been drawn, and which amounts to several lakhs.

12. Further complications next arose, when the son attempted to realize the rents due on account of the estates he had purchased. The father interfered, and *vice versâ*. The influence of Azeem Choudhury had been very great, and his tenantry at large combined to pay no rents to the persons who had purchased the estates. The result is that no rents have been realised, I am told, for some years.

13. For years past Azeem Choudhury has been implicated in serious cases, and his determined resistance to the Civil Court process is quite in accordance with the lawless character of his previous life.

15. The position of his affairs in last December was this, that all his estates together with his house had been sold, and there was nothing left to him but promissory notes of the value of several lakhs, all endorsed to a son with whom he was on bad terms, and therefore to him valueless. His sole possessions were the cash he had in his house at Dulai, together with the furniture, &c.; but an order had been issued for the attachment of all his property and for the arrest of his person.

16. He was closely watched by the decree-holder, as also by his son, and he could remove nothing. For the last three years he had more or less been in concealment to evade arrest, and he had no resource left but to allow his person to be arrested and the property to be attached, thus allowing of the whole of the promissory notes falling into the hands of his son; or to defend his stronghold, hoping that the terror of his name, and a show of force, would

intimidate the Civil Court Nazir, and the police in support, from effecting his arrest and attachment.

17. At this place it is best that I should preface reference to the occurrences of the 10th December by the following extract from a memorandum drawn up by the Magistrate of Pubna, Mr. F. H. Barrow :—

Memorandum on affairs connected with Azeem Choudhury.

"When I came to the district in May last, the sale of the estates of "Azeem Choudhury had been lately effected, and consequent on them many dis-"turbances were pending. There had lately been a murder case arising from "these disputes, and between 50 and 100 persons had been called upon to shew "cause why they should not give security. There were also many criminal "charges of violent crop-taking, &c., under trial. These cases were variously "disposed of. I had thus my attention at an early period drawn to the need of "watching this part of the country.

"In September I got a letter from Azeem Choudhury himself, saying he was "in confinement, and wishing me to come and see him. To this I replied he "might come in to me. He had also said his enemies wished to make away with "all his money, and his letter was soon followed by a request for a police guard "to bring his treasure into Pubna. This I granted. He accordingly came in, "though not with any treasure, and I gave him an interview. To it I invited "his son, Hydar Jan, who was fighting with him.

"I had understood that Azeem, though owning only between two or three "lakhs of decretal money, for which he was still being harassed, all his property "being attached, and body-warrants against him being at times taken out, had "some seven or eight lakhs in Government promissory notes. I immediately "suggested to him that he should pay off the decree; and as the sole difficulty "of utilising the promissory notes for this purpose was some question of who "was the real holder, the father or son, I attempted to induce them to come to "an agreement. While the father had the notes, they stood endorsed by him "to his son. It seemed therefore that the son had only to re-endorse them back, "when they would be available for clearing off the debt. The son at this time "readily assented to do his part, and I hoped that soon Azeem Choudhury would "be free from the processes of the Civil Court.

"I should mention that I had invited Mr. Brae, the attorney of the Official "Trustee, to come and meet me at the same time, that I might have the advant-"age of hearing from him, while in communication with Azeem Choudhury and "his son, what terms of payment would be accepted. I am sorry to say that "Mr. Brae resented my invitation as an uncalled for interference, and said that "Azeem Choudhury had only to pay the amount of the decree into Court, and "that he would not, owing to his conduct of a fraudulent character in the past, "meet him or discuss the matter through me. By the time Azeem Chowdhury "sent me in two lakhs of promissory notes for the son's endorsement, the latter "declined to fulfil his part and to sign the notes, on the ground that they had "been endorsed to him as a trustee for his father's wives.

"Owing to this my attempts to get the debt cleared off promised to be "unsuccessful. Mr. Brae applied to me for the numbers of the notes, and I "readily gave them. He thereupon applied to the Civil Court, and they were "attached.

"After Azeem Choudhury left Pubna, Mr. Brae obtained a body-warrant "against him, having applied for it whilst he was at Pubna in communication "with me. But nothing came of this warrant.

"In October affairs between Azeem Chowdhury and his son in their disputes "about collections in the estates purchased by the son became threatening. The "father was declaring that his estates thus purchased by his son had been "purchased only *benami* with money supplied by him; consequently he insisted "on continuing collections, and as the son insisted on stopping them, there was "serious danger to the peace. I accordingly asked the District Superintendent "to depute the Inspector of Police to remain at Dulai, and appointing special "constables in all the affected villages, I ordered daily reports to be taken from "the chowkidars of all events happening.

"In the meantime Mr. Brae, as attorney of the Official Assignee, was pur-
"suing his course; and in November he procured an order for the re-attachment
"of the house of Azeem Choudhury. Hearing that the warrant was to be served,
"I consulted with the District Superintendent about the means to be taken to
"preserve the peace. The orders I passed were that the police should be present
"near at hand, but should not aid in giving possession, and should merely inter-
"fere if there was an actual breach. I also ordered that Mr Brae was not to
"go in force to the spot.

"The Naib Nazir of the Civil Court was resisted: that is, some four or five
"men appeared and barred his way; beyond this there was no show of force,
"and the resistance was of a purely formal character.

"Before this attempt to take possession was made, Mr. Brae put in a petition
"to me to grant him police assistance, and I had recorded a memorandum refus-
"ing it, and referring him to the Civil Court. The above resistance therefore
"having taken place, the Civil Court was moved to apply to the Magistrate, and
"permission was also granted to prosecute those who had resisted the Naib
"Nazir.

"On the petition therefore of the pleader of Mr. Brae, I issued warrants
"against those charged with resistance of the Naib Nazir. This was on
" . Subsequently on the I received the order of the
"Judge to render the Nazir assistance to deliver possession. I accordingly
"passed an order to that effect, and the District Superintendent passed it on.
"What happened afterwards I have already detailed in my former report. It
"should be noted that this first denial of police help till the order of the Civil
"Court was obtained must have been known publicly, and I feel sure that the
"subsequent order for police assistance to be given was equally well known.
"As therefore the various proceedings leading up to my ordering the police to
"actively assist must have been known, I considered that the order when
"once passed would be executed without difficulty. Azeem Choudhury in his
"interviews with me gave me no reason to suppose he would oppose himself
"to the law. In fact, from the way he suddenly decamped, hearing of the
"warrant from the Civil Court, I conceived his possessing a dread of the Civil
"Court. He had applied to me to protect him in his journey back from Civil
"Court arrest, and owing to my informing him that I could not, he had so
"hurriedly left. Subsequently I heard that he had left Dulai altogether. The
"resistance to be expected I fancied was of the nature of barring the door, and
"such that a force of 20 police, headed by the District Superintendent, would
"immediately dissipate. That men armed with latties and spears should assemble
"in hundreds never entered my head. There were no questions in dispute
"between two angry parties, which might be set at rest by advice and declara-
"tion of the law, but only the simple order of the Civil Court to be enforced;
"and, as I thought, only the obstruction of a few retainers and domestics to be
"prevented by a judicious show of force. Even if Azeem Choudhury had desired
"to oppose the police, I could not have believed that he would have found persons
"insane enough to assist him in his obstinacy. However, for some reason or
"other, his servants and followers appear to have been possessed with law-
"lessness, and the old man's obstinacy by their aid became an attempt at armed
"defence."

18. This last attempt at arrest, referred to by Mr. Barrow, was not then the first attempt which had been made.

In the early part of 1881 there had been an attempt at the arrest of Azeem Choudhury. An application had been made in May for police aid to protect the peon. The orders of the Magistrate, Mr. Clay, were that two policemen under a superior officer should accompany the Civil Court peon, and if, after effecting entrance in a legal way into the house, he saw signs of resistance, he should retain his footing and send back for further assistance. The Magistrate's instructions were very clear that no aid whatever was to be given by the police in breaking open an outer door, as both section 271 and section 336* forbid the breaking open of any outer door of a dwelling-house. In the case alluded to, a head-constable was degraded by the Magistrate, Mr. Clay, for exceeding his

Civil Procedure Code.

authority, inasmuch as he had stationed constables to prevent ingress and egress to and from the premises.

19. Again in July 1881 the Judge asked for assistance to be given by the police.

20. Again in December 1881 a warrant was taken out for the arrest of Azeem Choudhury, and the Magistrate was requested by the Judge, in his letter No. 22J, dated 10th January 1882, to give proper protection to the peon. The Magistrate's order was that no attempt was to be made to scale any wall or to enter by a window; if resistance was made to the peon on approaching the outer door, or if, having found the outer door open and having entered, obstruction is met with, then further assistance should be called for. If the doors were found to be closed on entering the premises, the police were forbidden to remain on the premises. On all these occasions the doors were found closed. In August 1881 the Magistrate, Mr. Clay, wrote to the Judge of Pubna: "I am aware on the 6th that there was a considerable show of force on the part of Azeem Choudhury, and that the peon and the party with him were in some danger of being ill-treated, but that he (Mr. Clay) did not find that any act was done to disturb the peace, or which can be called an obstruction in the execution of the process of the Civil Court." The letter concluded by enquiring in what way the police could give further assistance.

21. In November 1882 the Naib Nazir had again been deputed to arrest the person of the judgment-debtor, with a view to watch the proceedings, and to render any legal assistance he could. The District Superintendent, on the 18th of November, remained several days on the spot. The Naib Nazir was unable to carry out his orders, and returned to Pubna.

22. In the meantime the wives of Azeem Choudhury petitioned to the Civil Court that the premises at Dulai belonged to themselves by virtue of a purchase they had made at an auction for sale of the judgment-debtor's property in execution of a decree. This plea was set aside, and again a warrant was issued for the arrest of the judgment-debtor and for attachment of his house and moveable property.

In the meantime the Judge had taken proceedings under section 328, and had referred the case to the Magistrate for trial. That case, in which the parties are charged with obstruction and resistance, is still pending.

23. Early in December the Civil Court issued a process under section 318, of the Civil Procedure Code, to deliver possession of the dwelling-house of Azeem Choudhury to the auction-purchaser, and also for the arrest of the person of Azeem Choudhury, and for the attachment of his moveable property.

24. On the 4th of December, the District Judge of Pubna addressed the Magistrate, and requested him to direct the police to give proper protection to the Nazir, and those officers of the Court who may accompany him, in the *discharge of the duty of delivery of the judgment-debtor's residence to the decree-holder*, and also in execution of the warrant of arrest of Azeem Choudhury.

On this requisition the Magistrate passed the following order to the District Superintendent:—"Who is requested to see that protection asked for is granted. He should enquire of the Judge's Nazir about dates. Dated 6th December 1882."

25. On the 7th, the District Superintendent issued the necessary orders to the Sub-Inspector of Dulai, the Inspector being absent engaged on another case. On his return the Magistrate deputed the Inspector, who arrived at Dulai at 3 A.M. on the morning of the 9th December, where Mr. Brae, the Agent of the Official Trustee, was, and also the Civil Court Nazir. The Inspector, after his arrival, sent in a report, in which he stated his apprehension "that there will be a strong and desperate resistance even at the loss of lives on both sides if the Civil Court process was to be actually enforced, or if the Nazir or Mr. Brae's men should attempt to break open the door of the house to effect a forcible entrance in the act of delivering possession." The Inspector further, in his report which I have before me, stated that he heard "that there are about 400 sirdars at hand to make the resistance."

The Inspector further stated that the force of the police he then had (the ordinary strength at the thana) was not strong enough to keep the peace amongst such a crowd of men." He also asked for the presence of the District Superintendent direct, to ensure peace and safety. The report thus concluded: "The Nazir will not proceed to his work till the receipt of an order from you."

On this report the Magistrate wrote as follows:—

"I have spoken to the District Superintendent on the subject of this letter. There is also a letter from Mr. Brae himself confirming the statement of the Inspector. Under these circumstances, I think it is as well that the District Superintendent himself should go, taking with him a force of eight or ten constables. *Possession must then be delivered immediately*, and should the Nazir refuse then and there to proceed to the execution of his duty under the support of the police, the District Superintendent is requested to withdraw the police force, and I will communicate with the Judge and hear his wishes on the subject." Mr. Brae also wrote to the District Superintendent: a copy of his letter is appended.

26. On the morning of the 10th, Mr. Rattray, in accordance with his instructions, reached the place about 10 o'clock A.M.

He found Mr. Brae and the Nazir near the registry office in a tent, with a number of his personal servants—not peons.

As the police were tired after a 20 miles' march at night, they were halted till 11-30, when the Nazir and Mr. Brae went towards the house of Azeem Choudhury. The police force present consisted of the District Superintendent, the Inspector, one Sub-Inspector, two head-constables, and 18 constables, of whom six were armed with muskets. The Sub-Registrar also went with the District Superintendent at his request.

27. When the District Superintendent first arrived at Dulai thana, he was informed by the Inspector, the Rural Registrar, and the Nazir, that Azeem Choudhury's house was full of armed latials, that a cannon had been dragged in, placed behind the main-gate and loaded, and that the inmates of the house were determined to resist to the very last. The report was made when the police party was at a distance of one mile from the house. As the party approached, the bazar in front of Azeem Choudhury's house was found full of people, who appeared very much excited. Before the District Superintendent started at or about 10 o'clock, he had sent word to Azeem Choudhury by persons who represented themselves to be his servants, that if any violence was used or his party was fired upon, he would fire upon the rioters. The police found the front of Azeem Choudhury's house crowded with people, ordinary spectators in appearance, who were ordered to disperse, and warned that they would be dispersed if they continued to mob the place. The crowd broke to re-form behind the police in a dense throng. A guard was left here to prevent the crowd from surging in after the police, but the sentries were unable to resist the pressure, and gave way.

27. The entrance to the premises is through a high arch. This place was blocked by unarmed people, most of whom were half-naked, their bodies oiled. A few were well-dressed, respectable looking men, who advanced to the District Superintendent and clasped hold of his legs, detained him, and begged of him not to proceed, as, if he did, there would be bloodshed, and Azeem Choudhury's people would kill him. The half-naked men were all this time yelling and shouting so that it was difficult to hear or give orders. Mr. Rattray explained to the men who were detaining him the reason why the police were present, and ordered the police to go on in support of the Nazir. A half-naked latial next ran at the police with his head down, with a loud shout; he was unarmed, but charged right into the police rank, and was then knocked down. His companions then ran back turning to the right, and joined a number of men who advanced brandishing latties and spears and shouting according to the Inspector, "*Ali, ali*"; according to the Nazir, "*Dhor, Dhor*." The District Superintendent, thinking the men meant

mischief, halted the police, and ordered them to load, with a view of frightening the crowd. After loading he pushed on, and ordered the police to arrest the armed men. As the police, in order to get at these men, advanced, the men separated; one party, about 25, ran round to the right, and others joined a body standing in front of a small doorway. As the police came near, they were assailed with brick-bats, the police party being struck repeatedly. Over the little door was a balcony running the whole length of the house. This was filled with people, as also an open low terrace on the left, densely crowded with people armed with spears, who were holding themselves up as if in the act of throwing them.

28. As Mr. Rattray halted his police, the clubmen advanced, brandishing their spears. The constables began falling back, getting mixed with the crowd; only four men remained with the District Superintendent. The head-constable, a Punjabee, raised his musket to fire. Mr. Rattray forbade him to fire, but believing he would be speared, took his gun out of the hands of his orderly, and fired a charge of snipe-shot at the men's legs in front of the door as they advanced. The shot was fired low. The men then rushed behind a wall.

29. The entrance to the door had been narrowed by piles of jute having been piled up. Behind these a number of spearmen were stationed guarding the passage to the door. After the first shot was fired a number of men armed with spears again rushed forward at the police. Mr. Rattray, seeing them coming, fired a second barrel of shot, hoping to stop them. Of the eighteen men who formed the police, only three constables, an orderly, and the head-constable were at this time with the District Superintendent; the rest were hanging back, unwilling to advance. The men were all scattered. Four shots were then fired by these men from behind without orders. Mr. Rattray states he was unable to get his men on because of the brick-bats which were being thrown.

30. After the shots were fired, the clubmen ran for the small door, blocking it up with timber and bales of jute. The police then rushed forward, and took shelter under the balcony to escape the brick-bats. The party was still outside the house, and there they remained some time. A deputation of men, whose names are known, then came to Mr. Rattray, and begged again of him not to try and enter the house, and that they would try and induce Azeem Choudhury to come to terms with Mr. Brae. The police then moved to the main entrance, and remained there outside for several hours, during which time one Abdul Suttur came backwards and forwards, offering the decree-holder various sums of money. Through the crevices of the gate a large number of spearmen were seen, who kept up a yelling and shouting.

31. It appears that during this time Azeem Choudhury was removing his wives, and some portion of his treasure, from another part of the house by a way at the back. The negotiations failing, and Abdul Suttur not again appearing, and the day closing, about 5 o'clock the Nazir ordered the doors to be taken off their hinges. The masonry was broken down, and the gates lifted off their hinges. The Civil Court Nazir then entered the premises. Two other doors were found barred, and were broken before entrance was obtained. In one of the inner courtyards, after the third gate was forced, two men were found lying wounded, who said they had been shot by the police; one had a bullet wound through his body, who has since died. The second man found was wounded with a bullet through the fleshy part of the leg. He is convalescent in hospital.

32. Inside were found 15 swords, 16 spears, three guns (one loaded), a great number of latties, also bows and arrows.

33. The property in the house was then attached by the Civil Court peons. Three iron chests were also found, which, when opened two or three days afterwards, were found to contain Rs. 1,29,000. A police guard was left that night in the house. The District Superintendent, after despatching the wounded men in palkies to Pubna, remained that night on the spot, and early proceeded to Pubna to report the matter to the Magistrate. On

the 12th, the Magistrate arrived. It was reported that Azeem Choudhury was then in concealment at the house of Kurshed Alum, a mat house adjoining his own, and connected with a doorway, which house was included in the Civil Court decree. The inmates denied he was there, but on the premises being searched he was found inside and arrested.

34. Azeem Choudhury stated before the Magistrate that he was not responsible for the riot, but that his servants had it in their power to appoint whom they pleased, and that they must have collected the clubmen.

35. No spears were thrown at the police, or any gun fired from the inside of the house Had the police forced their way into the house, the resistance must have ended in much greater bloodshed. Many of the spears found were English hog-hunting spears by Manton.

It is reported that there were upwards of 250 armed spearmen.

36. In making this enquiry. I have had the advantage of discussing the matter with the counsel for the Official Assignee, as also with the Counsel for Hydar Jan, the son of Azeem Choudhury, and with Hydar Jan himself, as also with the counsel of Azeem Choudhury and with the Sub-Registrar of Dulai, who was an eye-witness of the riot. The better to understand what occurred, I visited Azeem Choudhury's house, and went over the premises and the scene of the riot with the Magistrate, District Superintendent, the Police Inspector, and the Sub-Registrar.

The points to which in the course of this enquiry I have directed my special attention are—

1st.—The causes which have led to the litigation which placed Azeem Choudhury in the power of the Civil Court.

2nd.—Whether there is any reason to believe that Azeem Choudhury has been the victim of any conspiracy.

3rd.—Whether there was anything reprehensible in the conduct of the police in their support to the Nazir of the Civil Court on the 10th of December, or on any subsequent date.

4th.—Whether any order of the District Magistrate passed in connection with this case was illegal, or, if legal, unduly severe.

37. The first point has been fully explained. On the second point, of conspiracy, I find no suspicion whatever of such a contingency, or that Azeem was forced into resistance with a view to involve him in criminal proceedings. I find that Mr. Barrow did his best to bring Azeem Choudhury to reason, and advised him to put an end to all future harassment by payment. The decree was for Rs. 2,36,000. Subsequent events have shown that he had in loose cash Rs. 6,000, in his treasury Rs. 1,29,000, and Government notes about his person said to aggregate Rs. 2,00,000, so that he could have compromised the decree and freed himself from all apprehensions regarding the arrest of his person, or the attachment of his household goods, but he would not be guided by Mr. Barrow's advice.

38. The reason being that Azeem hoped to induce his son to re-endorse part of the notes back to him with a view to satisfy the decree. Azeem wished also to conceal the possession of the cash and notes amounting to some Rs. 3,35,000, his object in wishing to obtatn re-endorsement of some of the promissory notes, being that he hereafter might use that act of his son as evidence to refute his son's contention in Court that he could not re-endorse the notes as he held them *on trust* for members of his family.

39. Mr. Barrow failed as a conciliator, because the son contended that, as the interest due on the notes was sufficient to pay the decree, it was wasteful to sell the notes. To this proposal the father would not agree, because it would have placed the notes and the interest in the hands of his son. Rather than do this, he preferred once more to bar the doors of his house against the process of the Civil Court, and trust to the chapter of accidents to help him.

40. As to the third point, I find that, with the exception of four or five men, the conduct of the rest of the police was marked by extreme timidity. The shots were fired more in self-defence than aggressively. Had the District Superintendent and the four men alluded to showed any irresolution, very fatal

results would have followed, considering the excited state of the men armed with clubs and spears.

41. The determined character of the defence was the more marked by use having been made of piles of bales of jute, which the father had taken by force from Hydar, his son, some days previously, and which were used as gabeons to narrow the passage to the entrance door, and to give protection to the spearmen who lined the narrow passage.

42. In my opinion, the use of a shot-gun is to be regretted, for the reason that a shot-gun is not a legal weapon of legal defence or for enforcing a legal executive order. If it was necessary for defence muskets should have been fired. The District Superintendent no doubt was placed in a difficult position: his orders were to assist in giving possession, if the Civil Court officers were resisted; they were seriously resisted. No doubt the District Superintendent might have advised the Civil Court Nazir to desist from enforcing his process and have sent for the Magistrate, and for such further reinforcement as he might be able to bring, but the evidence shews clearly that the police were attacked, and acted in self-defence.

43. I have considered also whether Mr. Barrow was justified in only sending the District Superintendent of Police. Ought he to have gone himself, and employed a large force of police? The daily state of the police strength shews that only three men more were available from the reserve. The conduct of Azeem Choudhury in seeking the advice of the Magistrate, and in coming in person to the station a short time previously, and placing Government securities in Mr. Barrow's hands, appears to have misled the Magistrate; such conduct gave no grounds for any presumption that a determined opposition would be made. Mr. Barrow regarded the Inspector's statements as exaggerated.

44. As regards the fourth point, I find the Nazir was armed with three powers—(*a*) to give possession of the dwelling-house to the purchaser under section 318 of the Civil Procedure Code, (*b*) to attach moveable property, (*c*) to arrest. To carry out attachment and arrest, the Civil Procedure Code, sections 271 and 336, gives no power to break open any outer door. Under these sections, when the Civil Court Nazir found the outer doors blocked, no further steps could have been taken. Under section 318 the occupant of the house may be removed if necessary to give possession. In approaching the house the police were attacked.

Possession was taken of the house after it had been vacated by the occupants.

45. The following extract from the Magistrate's decision disposes of the point whether the orders passed were unduly severe:—

"He himself* is said to be 70 years of age, and his look is that of a very old man. Though holding him as criminally liable, I could not inflict on him a heavy sentence. The real criminality I conceive rests with those who managed the affairs of the vast establishment, and whose orders the servants obeyed. These are still at large, and have so far evaded all attempts to arrest them."

* *i. e.* Azeem.

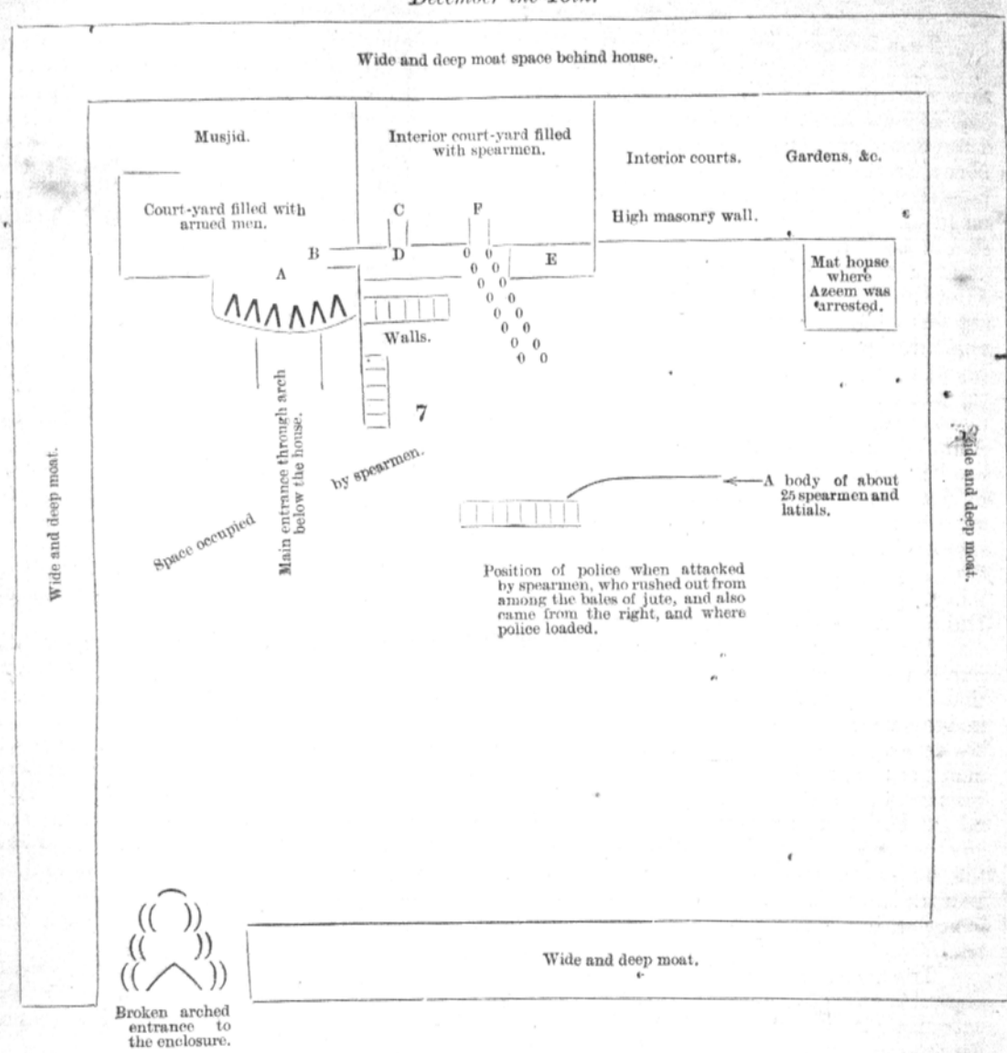
Dated the 9th December 1882.

Demi-official from—T. Beae, Esq.,
To—B. Rattray, Esq., District Superintendent of Police.

The Inspector informs me that serious resistance is likely to be made when the Civil Court Nazir proceeds to execute the warrant for possession of the house. He has ascertained that a large body of lattials has been collected, and the small police force here, even if to be relied on, of which there are doubts, is quite unable for the duty required. He is therefore reporting to you, and will ask you to come out with a large force of constables armed.

A small number of men will not suffice to overawe Azeem's party into obedience to law, and with but a small force to protect, the attempt to execute the warrant for possession may result in loss of life.

Rough sketch-plan of Azeem Choudhury's house and premises at Dulai, the scene of the riot on December the 10th.



A. Circular-fronted double-storied house with balcony filled with armed men, windows defended by men throwing brick-bats.

B. and C. Doors barred.

D. Passage defended by spearmen. The roof of this passage above also defended by spearmen.

E. Large masonry house with overhanging verandah, in which police took shelter from brick-bats. Filled with spearmen.

o o Piles of jute.

F. Small door through which spearmen re-entered the house.

The bricks were thrown from A and E. Large piles of bricks found in the rooms above.

No. 656G, dated Pubna, the 4th December 1882.

From—C. A. KELLY, ESQ., District Judge of Pubna and Bogra,
To—The Magistrate of Pubna.

I HAVE the honour to request that you will be good enough to direct your police to give proper protection to my Nazir, and those officers of the Court who may accompany him, in the discharge of the duty of delivery of the judgment-debtor (Azeemuddin Choudhury's) residence to the decree-holder, and also in execution of the warrant of arrest of the said Azeemuddin Choudhury.

Magistrate's order.

To the District Superintendent, who is requested to see that the protection asked for is granted. He should enquire of the Judge's Nazir about dates, &c.

6-12-82. F. H. B.

Order issued on Sub-Inspector of Dulai.

6-12-82. B. R.

JUDGMENT OF THE MAGISTRATE OF PUBNA

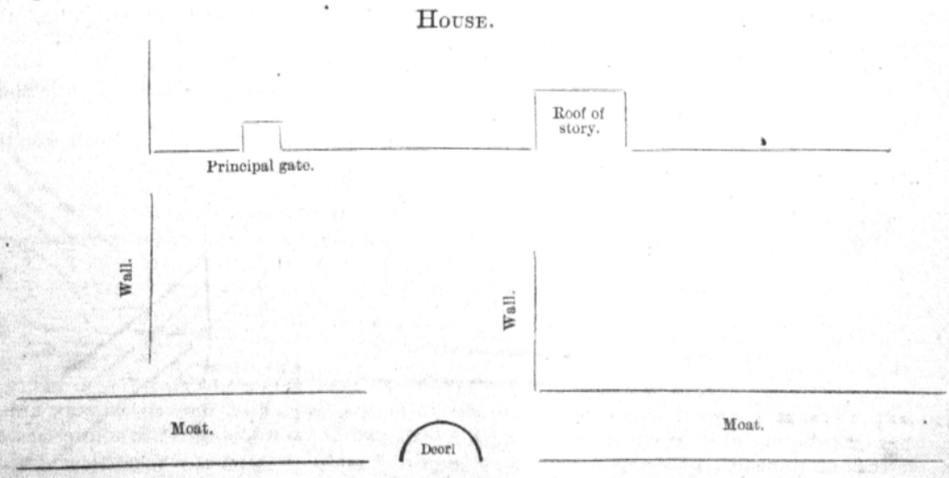
EMPRESS *versus* FAKIRUDDIN CHOWDHURY *alias* AZIM CHOWDHURY.

THIS is a most serious case of riot in which the Nazir of the Civil Court was resisted when he went to give possession to the decree-holder, and the police, under the District Superintendent himself, were opposed by a crowd of lattials and others armed with spears. The accused Azim Chowdhury is a large zemindar of the district, living at Dulai, and owes a large sum of money to the Official Trustee on behalf of the estate of N. P. Pogose. The Nazir of the Judge's Court tells us that he proceeded to Dulai on the 8th to deliver possession of the house of Azim Chowdhury and of 34 beeghas of land attached. In the meantime the Judge had addressed the Magistrate of the district, asking that the police should assist the Nazir in delivering possession. The Inspector of Police says he had been at Dulai for some time attempting to keep the peace between Azim Chowdhury and his son. First the Naib Nazir came on 18th November to deliver possession The police stood by to see there was no breach, but not being ordered to help did nothing. The Naib Nazir consequently, after giving notice of the possession and proclaiming the sale, had to return and report that he could not give possession. He tells us that he saw and spoke to Mojizuddin, the admitted dewan of Azim Chowdhury, at the time he was going through the formalities mentioned. However, he was opposed by men, who said the house had been purchased by Azim Chowdhury's wives, and he had no power to overcome their opposition. On the 8th, the Inspector received the order of the Magistrate to assist the Nazir. Mr. Brae, the decree-holder, appeared on the 9th. By this time the Inspector had made enquiries, and anticipating serious resistance he applied to the District Superintendent for extra police. The Inspector says every one knew of the decree, and there was great excitement. Mr. Rattray tells us that he passed on the Inspector's report to the Magistrate, and received orders himself to take a body of police and render assistance. On the morning of the 10th he arrived at Dulai, and there met the Nazir and Mr. Brae, the attorney of the decree-holder.

Mr. Rattray immediately on his arrival prepared to assist the Nazir. He gave out publicly, and before those whom he believed to be servants of the accused Azim Chowdhury, that he had come to give possession, and would, if necessary, use firearms. Then about midday he started with the force of 20 men or so to the house of which possession was to be delivered. First he was met by a crowd, then by a band of ruffian-like-looking men then unarmed; and men with them besought him not to enter as the house had women inside; that the people would resist him and there would be bloodshed, "khun" no doubt being the word used. The District Superintendent put these men aside, and advancing passed the "deori" into a kind of yard in front of the house. I myself have seen the house, as after the occurrence the District Superintendent came into Pubna, and on hearing his statement I ordered the issue of warrant, and myself left for Dulai next morning, the 12th. On that day I arrested Azim Chowdhury, and the same day began the trial.

The house is a large two-storied one, with a broad moat round it. The front, which presented the only means of ingress, is partly flanked by walls. Straight in front of the entrance gate or "deori" of the yard stands the massive entrance of the house. The accompanying sketch will give some idea of the place.

HOUSE.



To advance and gain an entrance by the main gate would have been a most dangerous attempt. It was commanded by balconies, and when the gate was reached no entrance could have been effected without a strong body of workmen. The whole face of the house was also strong, and the flanking walls gave cover to adversaries.

When the District Superintendent advanced through the first archway, he saw a large crowd of men armed with latties. It is said by the Inspector that the first opponents retreated to accused Kurshed Allum's house on the right, and, returning armed, joined the general body. The Nazir puts it that the first party, 25 or so, were joined by a reinforcement of about 50 men with latties. These men were shouting—*mâr, dhor*. The Nazir says

the Inspector gives their battle shout as *Ali Ali*. At the same time that this large armed crowd below were threatening immediate violence, a large body of men armed with spears and brick-bats came in view. It appears that the spearmen occupied the roof of a one-storied house to the right of the main gate, while the men with brick-bats held the balconies. There was great confusion and shouting, and the somewhat severe cross-examination of Mr. Bell has necessarily brought out some discrepancies as to who had spears and as to the number of men occupying the various points. The District Superintendent and all the witnesses say that their advance was not unattended with anxiety and fear of danger to the lives of themselves and the force generally. Most dreadful threats were used; men armed with spears, latties, and brick-bats were visible; and the police force were all in the open, while their enemies were either skirmishing round them, or securely posted up on a roof or balcony. It cannot, therefore, be expected that there would be a complete agreement about the details. About the serious nature of the resistance, however, there is no doubt. There were crowds of opponents in the open, and besides the balcony, which was a very long one, and the one-storied roof being closely occupied by armed defenders, there was the reasonable inference that the house itself contained others unseen. No firearms were seen; but who could feel sure that men in the house had not firearms. Brick-bats were thrown, and some hit the constables. Spears were threateningly pointed. Mr. Rattray had the orders of the Magistrate to assist the Nazir to deliver possession, besides the assembly before him was an unlawful, riotous one; and as a police officer he was bound to disperse it. Even apart from the execution of the warrant of possession, a substantive crime had now been committed. One hundred or two hundred men were rioting armed with deadly weapon. At this time, had the decree-holder and the accused come to terms, and the order of possession been stayed, the duty of the District Superintendent to disperse the unlawful assembly remained.

He tells us that he considered affairs most critical and accordingly fired his gun loaded with small shot. This had no effect, and he fired a second barrel. The constables then without waiting for orders fired three or four shots. Unfortunately the guns were loaded with ball. Even then there was no immediate giving in; brick-bats were still thrown. Soon after a cry arose that a man was killed and the defence collapsed. The police advanced to the main gate and negotiations were again opened. Of course, it was still open to the decree-holder to accept payment. Messengers passed, and two or three hours thus passed before the big gate was forced; some of the masonry had to be broken, and the gate was taken off its hinges. The police then entered, and the place was found well nigh deserted. One or two servants of the house appeared, and two wounded men were found. These were first tended there, and then sent in to the Pubna Dispensary, where one has since died.

The above is an account of the transaction, and it now remains to consider whether the present accused Azim Chowdhury has made himself criminally liable. Accused has been defended since the 18th by Mr. Bell, Barrister. On the 19th much of the evidence was gone into afresh; the charge was drawn up on the 20th, and Mr. Bell then intimated that he should not call any witness for the defence: and he merely cross-examined Mr. Rattray, the District Superintendent, after the charge had been drawn. He then addressed the Court, and his address occupied some time, and was concluded on the 21st. As there was no more evidence to be produced I adjourned the case till to-day for orders.

The charges this Court thought fit to draw up are (1) abetment of resistance to public servant, the abetment consisting of the accused not giving information of the unlawful assembly, and by other means; (2) conniving at hiring, &c., of persons to join in an unlawful assembly, which connivance is shown by not giving information and by allowing his servants and agents to be concerned in the resistance; (3) abetting a riot with deadly weapons, the abetment consisting of the same acts and omission as the connivance in the former charges.

Mr. Bell meets these charges by arguing that Azim Chowdhury was neither owner nor occupier of the house and consequently had no liability of giving information laid on him, and cannot be held to have had any share in the resistance, as he was nothing but a visitor or lodger in the house. It is admitted that the house and grounds were sold in 1878 and purchased by Azim Chowdhury's wives, and Mr. Bell has sought to show from a few statements made by Iddu Khan, a witness called for the prosecution, that since that date Azim Chowdhury has had nothing to do with the management of the house, and that Abdul Chutter and Mojizuddin, the principal amlah, have been the servants of accused's wives. It is therefore reason d that since the house was sold in 1878, Azim Chowdhury has ceased to be the proprietor, and has also relinquished all management, that therefore he is not owner or occupier, and can in no ways be held responsible for the riot.

It is also urged that Azim Chowdhury is an old man of impaired faculties, and could not be expected to manage.

To prove the ownership of the house, the prosecution put in, though the Counsel for the defence objected, the judgment of the Judge of Pubna dismissing the claim of the wives. When the house was attached again, they objected to the attachment. This objection was overruled by the Judge on the 27th January 1882. If I am right in admitting this document, it forms very strong proof of the accused's ownership. I admitted it on the following grounds. The defence is that the house is not accused's, but his wives, but the claim of the wives to hold the house had just been dismissed. Ownership after all can only be decided by the law. The law had said his wives do not own the house; it disproves the assertion therefore of the defence that they do, proving a fact inconsistent with the defence.

However, the liability of the accused does not depend on ownership. It was never intended that the criminal court should decide such difficult questions before a person could be convicted. Under section 155 the occupier is equally liable, and I have therefore only to determine whether Azim Chowdhury was the occupier of this house, and, as such, connived at and promoted the hiring and engaging of the persons who committed the riot.

The proofs of occupancy, if not of ownership, are that the house is known as his; the Inspector immediately before had interviews with him there, and people even on the day and at the time of the riot spoke of him as the person interested in the delivery or non-delivery of possession. The decree on which the warrant of delivery of possession of this house was granted was against him. Mojizuddin, whom he admits to be his dewan, came and spoke to the Naib Nazir, when he went to deliver possession; and it is Mojizuddin who appoints the servants, was also arrested in a house adjoining; and there is no attempt to show that he was not present at the time of the riot. And, moreover, the chests of treasure attached and opened by the Nazir, and found to contain Rs. 1,29,000, belonged to Azimuddin, for he gave the Nazir the keys.

So that, even if the judgment dismissing the claim of the Bibis is not evidence, there is still ample proof that Azim Chowdhury is the occupier of the house intended by the law. It is clear that, having been once the proprietor, he never relinquished the possession in favour of his wives. In fact, even if there were no proof of his occupancy, it might be presumed that the purchase by his wives had not deprived him of it.

A note in MacPherson's Morgan's Penal Code says, under section 150, "the ordinary law of abetment might be sufficient to punish those who by engaging and hiring others instigate them to join an unlawful assembly. But if the prime agent keeps aloof, and the work of hiring, though known to him, is left entirely to his managers or servants, he will probably succeed in evading the ordinary law. The terms of this section therefore extend not only to acts of instigation by the master, but to acts of instigation when done by others (his agents) and knowingly permitted or connived at by him."

The above remarks appear completely to cover this case as it says further on "direct acts of hiring may not be often procurable The relation of the parties, their conduct, and the circumstances generally must furnish grounds of presumptive proof."

In the present case there are the strongest grounds of presumptive proof connecting Azim Chowdhury with the occupancy of the house and ground attached, and with an interest in it, and that for his benefit therefore the riot was committed. It may be safely asserted that if he cannot be held guilty as the occupier, nobody can. Were he acquitted, the Bibis would plead that their holding the house was only *benami*, and no principle could be reached

I hold therefore that Azim Chowdhury was the occupier of the house in the sense intended by the law. Though the fact of disproving the strong presumption of possession raised by the evidence of the prosecution lies peculiarly in his power, his Counsel has chosen to call no defence witnesses. The strong presumption therefore remains unrebutted, and this Court must consider the occupancy proved.

And if accused was the occupier, he must be presumed to have hired, engaged, or connived at the hiring and engagement of the persons forming the unlawful assembly. It was his duty actively to co-operate with the law. This of course he never did, and *under the circumstances* his neglect to do so is a proof of abetment.

The argument that he is an old man, unfit to manage his affairs, has some weight. He is evidently a self-willed, obstinate old man, whose resistance to the legal decisions of the Courts amounts almost to imbecility. But he is still responsible for his perversity and obstinacy, which have now become criminal. I am willing to believe that he has had unprincipled and active advisers; and while I shall take this fact into consideration in awarding the punishment, I cannot let this be accepted as a defence to the charge.

He is a man also of wealth and position in the district, and though the resistance to lawful authority that he has abetted is of a very criminal nature, I shall inflict on him only imprisonment of a simple kind I have forgotten to mention in my judgment that 16 spears, 15 swords, and 3 guns were found in the house when entered; and this armoury of weapons was evidently in the hands of the rioters. One of the guns was loaded, and the swords were of a very serviceable description. From these preparations and from the weapons found it is evident that nothing but a large force of police, backed up with determination, could have taken possession of the house. That none of the police were killed or dangerously wounded is an extremely fortunate occurrence for the accused. Had any lattial rashly hurled a spear, there might have been serious loss of life, or again, had not the police force been so large and headed by a European officer, this undisciplined mob might have been emboldened to make a very effective resistance, which would either have driven off the police, or caused great loss of life. However, the accused is entitled to benefit by the slightness of the actual resistance.

I am clearly of opinion that accused's offence comes under section 150, and is not of the less serious nature covered by section 155. He would have been guilty under the latter section even if he had been absent, if his occupancy had to be still proved. But accused was actually on the spot, and must have witnessed all the preparations or heard of them, and exactly occupies the position of the person sought by the law to be made responsible for a riot, though not actually and bodily present in the affray. I shall therefore convict under all the charges

The Court finds Fakiruddin *alias* Azim Chowdhury guilty of the first charge, and under sections 183 and 109, sentences him to 6 (six) months' simple imprisonment and Rs. 1,000

(one thousand) fine, and in default of payment to suffer another one month's simple imprisonment.

The Court finds Fakiruddin *alias* Azim Chowdhury guilty of the second charge under sections 150 and 148, and sentences him to a fine of Rs. 1,000 and in default to one month's simple imprisonment.

The Court finds Fakiruddin *alias* Azim Chowdhury guilty of the third charge under sections 148 and 109, and sentences him to a fine of Rs. 1,000, and in default to one month's simple imprisonment.

PUBNA,
The 23rd December 1882.

F. H. BARROW,
Offg. Magistrate.

JUDGMENT OF THE JUDGE OF THE 24-PERGUNNAHS.

AZIMUDDIN CHOWDHURY ... ... *Appellant.*

PRISONER appellant, has been charged and convicted under section 183, coupled with sections 109, 155; under section 148, coupled with sections 150 and 155; and lastly under section 148 coupled with section 109 of the Penal Code.

The Court is decidedly of opinion that the above charges as they stand have not been established. The prosecution had to show that prisoner was guilty of abetment under section 109, and of connivance under section 150. They certainly have not sufficiently proved any act of connivance under section 150, and all that they have satisfactorily shown in the way of abetment under section 109 is that the prisoner did not give any information to the police. Looking to the undoubted fact that the police were notoriously possessed of full information as to the probability of an illegal assembly taking place, it seems clear that prisoner cannot be said to have been guilty of abetment simply because he did not tell the police what they already knew.

The Court, however, after careful consideration of the evidence, has arrived at the conclusion that the prosecution has established certain facts which support the conviction of prisoner under sections 148 and 155. It has been satisfactorily shewn that, when the police arrived on the spot, they there found on the premises of which they had to deliver possession an assembly of persons who behaved in such a manner as to produce the impression that resistance to lawful authority was intended. It has also been shown that the result of the conduct and attitude of the said assembly was a disturbance which resulted in a serious loss of life. Lastly, there is in the opinion of this Court sufficiently good testimony to show that the prisoner was the owner of the land, respecting which the riot took place for his benefit, and that he did not use all the lawful means in his power to prevent such illegal assembly and riot from taking place.

Messrs. Branson and Bell have appeared for the prisoner, and have contended in the first place that there was no illegal assembly in the premises when the police arrived on the spot. Only the usual household servants were present, and all they did, it is argued, was to entreat Mr. Rattray, the District Superintendent of Police, not to enter the house.

This Court, however, cannot concur in this view of the case. It was well known that the decree-holder had a clear legal right to be put into possession; that he had once already failed to obtain possession; and that the Judge had applied for police assistance in effecting the execution of the decree. Under such circumstances it was evidently the duty of the owners, occupiers, and household servants to avoid any such assemblage or demonstration as would justify the inference that further resistance was intended. Instead of this, not only were a considerable number of persons collected on the premises, but they behaved in a manner likely to excite the large crowd of sympathisers who had assembled outside. They indulged in loud protestations, threw themselves at Mr. Rattray's feet, and although they certainly asked him not to come in, they added to their entreaties the very significant words that if he did come in there would be murder, or, as the defence interpret the words used, that certain ladies would kill themselves. Looking to the whole circumstances of the case, this Court has no hesitation in holding that the assembly was at the very outset an illegal one, got up with the intention of impeding in some way or other, if not of actually resisting to the very end, the execution of the decree.

Messrs. Branson and Bell have further contended that even if it be admitted that there was an illegal assembly when the police first arrived on the spot, the riot which took place afterwards was caused by the injudicious conduct of Mr. Rattray in then and there knocking down an individual who, he says, rushed to the centre. It was only after this display of violence on the part of the police that, so it is argued, brickbats began to fly about and the disturbance actually began.

With reference to this argument, this Court holds that it is of no real weight. It is possible, but by no means certain, that the brickbats should not have been thrown if Mr. Rattray, instead of knocking down the man who rushed forward, had had him quietly arrested. But even supposing that a less violent course than that adopted by Mr. Rattray, at the early stage of the affair might have had the effect of preventing a disturbance, or that greater forbearance later on, when the brickbats were flying about, might have rendered the disturbance less serious, those persons who by their unwarrantable behaviour caused the police (so it it said) to lose their presence of mind must be held primarily responsible for what occurred. Want of coolness on the part of members of the public force on such diffi-

cult occasions may expose them to blame on the part of their superiors, or to severe criticism on the part of the public at large, but can in no way give immunity to persons who bring about circumstances of a nature clearly calculated to produce in the minds of persons entrusted with the execution of orders issued by the tribunals of the land the impression that illegal resistance is intended, the Court has no hesitation in holding that, whatever might be the view taken as to the action of the police, its judiciousness or otherwise, the persons who first formed the illegal assembly on this occasion must be looked upon in the eye of the law as having caused the riot which subsequently took place.

Messrs. Bell and Branson have lastly contended that the prisoner is not liable under the provisions of section 155, because it has not been shown that he is an owner or occupier of the premises where the disturbance took place. They also argue that the finding of the Civil Court to the effect that the prisoner is the rea owner, is not evidence against him in this case. Mr. Bell specially argues that prisoner could not be held to be an occupier, and, as such, liable under the provisions of this section. Either his wives are the real owners, or the prisoner is. If the former are owners, they and they only are responsible.

With reference to the above arguments, the Court has to remark that it quite concurs with the learned Counsel for the prisoner in thinking that the finding of the Civil Court is not evidence, and also in the view that the prisoner could not well be held liable as as occupier

It is, however, of opinion, after a very careful consideration of the evidence, that it cannot be for a moment held that the prosecution have in no way proved the prisoner to be the real owner. Putting altogether aside the finding of the Civil Court, there is a body of evidence on the part of the prosecution, which, taken as a whole, irresistibly leads, *in the absence of rebutting evidence*, to the conclusion that prisoner is the real owner, and that the recent purchase in the name of his wives was a mere make-believe which did not effect any actual and *bonâ fide* change of proprietorship. It has been shown that prisoner resided till very recently, indeed though perhaps not at the very moment of the riot, in the premises which formerly belonged to him in name as well as in fact that his position before the world continued to be the same as before, that a large sum of money belonging to him was kept in the house, that he in a conversation with the Sub Inspector spoke of the house as his. Lastly, there is the sworn evidence of Iddu Khan as to the house being now actually the property of prisoner. All the general circumstances and features of the case also tend to support such an inference. In short, it can hardly be denied that the prosecution have established a very strong and not a mere *primâ facie* case of ownership as against the prisoner which he was bound to disprove by material evidence of some sort, the more so as the facts necessary to establish his wives' real ownership were peculiarly within his knowledge, indeed so much so that very direct evidence on the subject could not fairly be expected at the hands of the prosecution.

It would, however, appear from the record that the prisoner has done absolutely nothing to show that the ladies, his wives, are the real owners, except to state in the most general way that on a very recent occasion, when the premises were put up for sale by a judgment-creditor, they were bought up in the name of the ladies. The mere allegation of such a circumstance, though it certainly has the effect of throwing the legal burden of proof on those who assert that the purchase was effected by others than those whose name appears in the affair, does not seem to this Court, in the absence of any good corroborative proof, and looking to the great prevalence in this country of such nominal purchases, especially under circumstances similar to those which existed in the present instance, to be of any great weight or to have any great probative force as compared with the evidence to the contrary put forward by the prosecution and commented upon above. The Court has no hesitation in holding, with reference to this the last and certainly the strongest point raised in prisoner's favour, that he has not succeeded in rebutting, as he might easily have done, had the property been really transferred to his wives, the case of real ownership set up against him by the prosecution.

The Court having for the above reasons arrived at the opinion that the facts established by the prosecution are sufficient to support a conviction under section 148 and section 155, it only now remains to decide as to the amount of punishment which should be inflicted. Looking to the very serious results of the disturbance, and to the fact that the prisoner is a person of position and education who ought to have thoroughly well understood the necessity of at once conforming to the orders of a legally constituted tribunal, it is quite clear that a very material fine ought to be imposed. The sentence of this Court therefore is that prisoner do pay two thousand rupees fine or in default do suffer two months' simple imprisonment.

J. F. BROWNE,

Sessions Judge, 24-Pergunnahs.

Rainfall, Weather, and State and Prospects of the Crops.

Statement showing Rainfall, Weather, and State and Prospects of the Crops in the different Districts of Bengal, as reported to Government during the week ending the 24th February 1883.

	No.	District, and date of return.	Rainfall at Sudder Station in inches.	Character of the weather, state and prospects of the crops, and state of health at date.
BENGAL.				
		Western Districts.		
BURDWAN DIVN.	1	Burdwan, Feb. 24 '83	Nil	Weather—seasonable. Sugarcane and *rubbee* crops being cut. Cholera reported from several thanas.
	2	Bankoora, „ 24 „	Nil	Weather—bright at the beginning of week, but latterly cloudy. Pressing of sugarcane still going on. Prospects of crops on the ground fair. Fever abating.
	3	Beerbhoom „ 24 „	Nil	Weather—seasonable. Cold-weather crops being harvested with a fair outturn. Sugar manufacture going on. Public health good.
	4	Midnapore „ 24 „	Nil	Weather—seasonable. *Boro* rice is being sown. Public health good.
	5	Hooghly, „ 24 „	Nil	Weather—getting unseasonably warm. Harvesting of winter crops nearly over. Public health good; but cholera is reappearing in a few villages.
		Howrah „ 26 „	Nil*	Weather—still cool; heavy rain on Sunday night (25th) State and prospects of crops good. General health good.
		Central Districts.		
PRESIDENCY DIVN.	6	24-Pergunnahs, Feb. 26 '83	Nil*	Weather—seasonable. Harvesting of late rice completed. *Rubbee* crops being gathered. Fever and cholera have abated.
	7	Nuddea, „ 24 „	Nil	Weather—clear and cold after a few days of hot weather. Prospects of crops good. Fever decreasing
	8	Khoolna, „ 24 „	Nil	Weather—seasonable. Cold-weather crops are being stored. Outturn average. Public health fair.
	9	Jessore, „ 24 „	Nil	Weather—warmer; bright. Winter crops almost harvested. Spring sowings going on. General health good.
	10	Moorshedabad, „ 24 „	Nil	Weather—getting warmer, but fine. Prospects of winter crops good. *Boro* rice cultivation has commenced. There are a few cases of small-pox in thanas Dowlatabad and Gowas.
RAJSHAHYE AND COOCH BEHAR DIVN.	11	Dinagepore, Feb. 23 '83	Slight rain on 22nd.	Weather—cool. Prospects of pulses good. Preparation of land for *bhadoi* rice going on. Price of rice has risen slightly; it sells at from 19 to 28 seers per rupee.
	12	Rajshahye, „ 24 „	Nil	Weather—seasonable. Sugarcane crop good. *Rubbee* crops fair. Fever prevalent. Cholera in outpost Tahirpore.
	13	Rungpore „ 23 „	Nil	Weather—uncertain and at times cloudy. Mustard, sugarcane, ginger, &c., are still being harvested. Rain would benefit wheat and pulse. Mango trees are in blossom No cholera reported.
	14	Bogra, „ 24 „	Nil	Weather—still cold and bracing. Hemp and sugarcane good; *kaon*, *kheraehi* and pulses fair. Public health good. A few cases of cholera reported from thana Bogra, and of chicken-pox from thana Sheriakandi.
	15	Pubna, „ 24 „	Nil	Weather—cool and fine Crops good throughout the district.
	16	Darjeeling, „ 24 „	Nil	Weather—high wind for part of week, otherwise fine. Wheat and barley coming on well.
	17	Jurpigoree, „ 24 „	Nil	Weather—clear and getting warm, though somewhat variable. Standing crops doing well. Land being prepared for *bhadoi* paddy. Public health good.
		Cooch Behar, „ 22 „	Nil	Weather—becoming warm West wind during day. Prospects of tobacco and other standing crops favourable. Harvesting of mustard-seed still going on. Public health good.
		Eastern Districts.		
DACCA DIVN.	18	Dacca Feb. 24 '83	Nil	Weather—seasonable. Prospects of *boro* paddy and winter crops good. Harvesting of mustard-seed continues.
	19	Furreedpore, „ 24 „	Nil	Weather—cold and clear. Standing crops doing well. Ploughing for *aus* is going on. General health fair. A few cases of cholera reported from Palong.
	20	Backergunge, „ 22 „	Nil	Weather—hot for the season of year. Outturn of *amun* rice good. Prices moderate. General health satisfactory.
	21	Mymensingh, „ 23 „	Nil	Weather—getting warm. State and prospects of crops good. Public health generally good.
CHITTAGONG DIVN.	22	Chittagong, Feb. 27 '83	0·78†	Weather—seasonable till 25th, since which rainy. Prospects of spring crops fair. Prices have somewhat risen. A few cases of cow-pox reported. Public health generally good.
	23	Noakholly, „ 22 „	Nil	Weather—rather warmer; occasionally cloudy; mornings generally foggy. Winter crops are suffering a great deal from the long drought. Rain is wanted throughout the district.
	24	Tipperah, „ 23 „	Nil	Weather—fair; temperature changeable. State and prospects of crops good. Rape seed being harvested. Cultivation in good progress
	25	Chittagong Hill Tracts, „ 20 „	Nil	Very hot clear weather. Sugar still being worked off. Mustard crop reaped. Tobacco doing fairly *Jhums* nearly cut.
		Hill Tipperah, „ 21 „	Nil	Weather—getting warmer. Sugarcane still being cut. Prospects of chillies and tobacco favourable. Public health good.

* For week ending 24th instant.
† For week ending 20th evening.

	No.	District, and date of return.	Rainfall at Sudder Station in inches.	Character of the weather, state and prospects of the crops, and state of health at date
BEHAR.				
PATNA DIVS.	26	Patna, Feb. 24 '83	Nil	Weather—seasonable. Reaping of mustard, pea and *mussoor* is fast going on. Wheat and barley are ripening. Collection of opium has commenced. Public health good.
	27	Gya, „ 24 „	Nil	Weather—pleasant. Thrashing of paddy almost finished. Prospects of *rubbee* crops promising. General health good.
	28	Shahabad, „ 24 „	Nil	Weather—fair, except in Bhaboua sub-division, where fair and cloudy at intervals. Harvesting of pea crop in progress. Prospects of other *rubbee* crops generally favourable, except in Bhaboua sub-division, where wheat, barley and linseed are reported to have been damaged by blight owing to cloudiness of weather.
	29	Durbhunga, „ 24 „	Nil	High west wind blowing. Barley and wheat are ready to be cut. Tobacco crop being cut. Prices stationary. Public health generally good.
	30	Mozufferpore, „ 24 „ Hajeepore ...	Nil 0·09	Weather—getting warm. *Rahar*, wheat and poppy slightly injured by frost. Other *rubbee* crops doing well. Fever still reported from Seetamarhi and elsewhere, otherwise public health good
	31	Sarun, „ 24 „ Gopalgunge ...	Nil 0·10	Weather—bright and clear; west wind blowing. Prospects of *rubbee* crops continue favourable. Linseed rather poor. Indigo sowings commenced. General health good.
	32	Chumparun, „ 24 „	N	Weather—seasonable. Prospects of all crops, with the exception of poppy, continue favourable. Public health generally good.
BHAGULPORE DIVS.	33	Monghyr, Feb. 24 '83	Nil	Weather—seasonable. Westerly wind blowing. Pulses slightly damaged by late rain. Prospects of wheat and barley good. Public health good.
	34	Bhagulpore, „ 24 „	Nil	Weather—seasonable. State and prospects of crops fair. Public health good.
	35	Purneah, „ 24 „	Nil	Weather—cold; westerly wind. Prospects of crops good. Health good.
	36	Maldah, „ 24 „	Nil	Weather—cold and clear, but getting warm in the day. *Rubbee* crops looking well. Prices of food-grains stationary. General health good.
	37	Sonthal Perghs. „ 24 „	Nil	Weather—getting rapidly warmer in the day; nights still cool. There are very little crops now on the ground. Some cases of small-pox reported from Godda sub-division.
ORISSA.				
ORISSA DIVS.	38	Cuttack, Feb. 23 '83	Nil	Weather—seasonable. Reaping of *sarad* crop completed. *Rubbee* crops being gathered. Wheat, *dalua* rice and tobacco growing well. Common rice selling at from 22 to 30 seers per rupee. Public health generally good, except in pergunnah Romito, where cholera is reported to have appeared.
	39	Pooree, „ 22 „	Nil	Weather—seasonable. Harvesting of *sarad* crop still going on. *Dalua* rice plants growing well. Miscellaneous crops good. Prices stationary. Cholera and cattle-disease still reported
	40	Balasore, „ 23 „	Nil	Weather—morning and evening cool, hot in the daytime. *Rubbee* crops are being thrashed. Sugarcane-pressing still going on. Small-pox reported from some places.
CHOTA NAGPORE.				
South-West Frontier Agency.				
	41	Hazaribagh, Feb 23 '83	Nil	Weather—clear and cold. Prospects of standing crops good. Cases of small-pox still reported from some of the thanas. General health good.
	42	Lohardugga, „ 24 „	Nil	Weather—seasonable. Rain wanted for spring ploughings in the head-quarters sub-division. *Rubbee* harvest in progress. Public health good, but cattle-disease is on the increase in Palamow.
	43	Singbhoom, „ 23 „	Nil	Weather—seasonable. Cold-weather crops doing well. Small-pox continues in the district, but is decreasing. General health otherwise good.
	44	Manbhoom, „ 24 „	Nil	Weather—fine and cool, but getting gradually warmer. Cane-pressing continues: outturn good. Wheat and other standing crops doing well. Small-pox reported from Raghunathpore and Bagmundi, and cattle-disease from Jaipore.

Published for general information.

CALCUTTA, STATISTICAL DEPT.,
The 27th February 1883.

COLMAN MACAULAY,
Secy. to the Govt. of Bengal.

Results of the Meteorological Observations taken at the Alipore Observatory from 18th to 24th February 1883.

Month.	Date.	Maximum in sun.	Number of hours of sunshine.	Mean pressure barometer at 32° Fahr.	Temperature. Mean.	Temperature. Maximum.	Temperature. Range.	Temperature. Minimum.	Hygrometry. Mean wet bulb.	Hygrometry. Vapour tension.	Hygrometry. Dew point.	Hygrometry. Humidity.	Wind. Prevailing direction.	Wind. Miles recorded.	Rain.	Weather.
1883.		°		Inches	°	°	°	°	°	Inches	°	%			Inches	
Feb.	18th	138·5	10	29·987	69·2	82·4	24·1	58·3	63·4	0·507	59·3	73	SW and calm ...	52	Nil.	Clear, ≡, ◺.
"	19th	140·0	11	·997	71·9	85·7	25·6	60·1	61·8	·523	60·2	69	S and SW ...	88	"	Partially cloudy, ≡, ◺.
"	20th	142·0	11	·952	76·4	89·5	?	?	69·3	·622	65·2	71	SW, SW by W, and W by N.	132	"	Chiefly cloudy.
"	21st	138·5	10	·940	76·2	88·5	21·8	66·7	70·6	·675	67·5	76	SW by W and variable	52	"	Partially cloudy, ≡, ◺.
"	22nd	138·0	11	·913	74·0	86·6	20·7	65·9	63·4	·448	55·9	56	N by E and N by W	100	"	Clear, ◺
"	23rd	135·2	10	·928	70·5	81·6	21·3	60·3	58·7	·340	48·4	48	NNE and NNW ...	70	"	clear, ◺.
"	24th	139·0	10	·917	69·9	83·7	26·6	57·1	59·5	·371	50·6	55	W by N, calm and variable.	63	"	Partially cloudy, ≡, ◺.

	Inches
The mean pressure of the seven days	29·948
The average pressure of the corresponding period for 24 years, S. G. Office ...	29·937
	Hours.
The total number of hours of sunshine of the seven days	73
	°
The mean temperature of the seven days	72·6
The average temperature of the corresponding period for 24 years, S. G. Office ...	74·8
The extreme variation of temperature during the seven days	32·4
The maximum temperature during the seven days	89·5
	Miles
The highest velocity of the wind in one hour during the seven days	13
	lbs.
The highest pressure of the wind on on square foot during the seven days ...	Not measureable.
	%
The mean relative humidity during the seven days	64
The average relative humidity of the corresponding period for 24 years, S. G. Office ...	66
	Inches.
The total fall of rain from 18th to 24th February 1883	Nil
The average fall of the corresponding period for 24 years, S. G. Office	0·28
The total fall from 1st January to 24th February 1883	0·07
The average fall of the corresponding period for 24 years, S. G. Office	1·36

The mean pressure, temperature, &c., are deduced from the traces of the Barograph and Thermograph.

The maximum and minimum temperatures are obtained from self-registering thermometers. All the thermometers are verified, and the readings have been corrected to a standard constructed and verified at the Kew Observatory. They are exposed under a thatched shed open at the sides, and are suspended four feet above the ground.

The barometer readings are corrected approximately to those of the standard Newman's No. 86, formerly at the Surveyor-General's Office.

The hygrometric elements are obtained from Tables III, IV, and V of the official tables computed in the Meteorological Office, and based on Regnault's modifications of August's formula.

The direction of the movement of the wind are taken from the trace of a Beckley's anemograph.

The mouth of the rain-gauge is one foot above the ground.

≡ fog, ◺ dew.

HENRY F. BLANFORD,
Meteorological Reporter to the Government of India.

METEOROLOGICAL OFFICE, INDIA,
The 26th February 1883.

Table of Rainfall recorded at Stations in Bengal in January 1883.

Divisions.	Stations.	First week. 1	2	3	4	5	6	7	Total rainfall of the week.	Second week. 8	9	10	11	12	13	14	Total rainfall of the week.	Third week. 15	16	17	18	19	20	21	Total rainfall of the week.	Fourth week. 22	23	24	25	26	27	28	Total rainfall of the week.	Last three days. 29	30	31	Total rainfall of the last three days.	Total rainfall for the month.	Average rainfall for the month.	Heaviest rainfall during the month.	Total rainfall from 1st January 1883 up to 31st January 1883.	Average rainfall from 1st January up to the 31st January 1883.
	Bengal.																																									
	Burdwan District.																																									
Burdwan	Burdwan	...	...	...	...	...	...	...	Nil	...	...	0·01	...	...	...	...	0·01	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	0·10	0·10	...	...	...	Nil	0·11	0·30	0·10	0·11	0·30
	Cutwa	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·21	...	0·21	...	...	...	Nil	0·21	0·48	0·21	0·21	0·48
	Culna	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·08	0·05	0·13	...	...	...	Nil	0·13	0·35	0·08	0·13	0·35
	Raneegunge	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·34	—	Nil	0·34
	Bankoora District.																																									
	Bankoora	...	...	...	...	...	...	...	Nil	...	...	0·21	...	...	...	...	0·21	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·25	...	0·25	...	...	...	Nil	0·46	0·34	0·25	0·46	0·34
	Bishenpore	...	...	...	...	...	...	...	Nil	...	0·25	0·30	...	...	...	...	0·55	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	0·55	?	0·30	0·55	?
	Maliara	...	...	...	...	...	...	...	Nil	...	...	0·18	...	...	...	...	0·18	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·13	...	0·13	...	...	...	Nil	0·31	?	0·18	0·31	?
	Khatra	...	...	...	...	...	...	...	Nil	...	...	0·82	...	...	...	...	0·82	...	...	...	...	...	...	...	Nil	...	...	...	...	0·70	...	...	0·70	...	...	0·28	0·28	1·80	?	0·82	1·80	?
	Beerbhoom District.																																									
	Soory	...	...	...	...	...	...	...	Nil	...	...	0·06	...	...	...	...	0·06	...	...	...	...	...	...	...	Nil	...	...	...	0·09	...	0·87	0·05	0·21	...	...	...	Nil	0·27	0·46	0·09	0·27	0·46
	Hitampore	...	...	...	...	...	...	...	Nil	...	...	0·09	...	...	...	...	0·09	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·08	...	0·08	...	...	...	Nil	0·17	0·56	0·09	0·17	0·56
	Rampore Haut	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·52	—	Nil	0·52
	Midnapore District.																																									
	Midnapore	...	...	...	...	...	...	...	Nil	...	2·45	...	...	...	...	...	2·45	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·60	...	0·60	...	...	0·08	0·08	3·13	0·80	2·45	3·13	0·80
	Tumlook*	...	...	...	...	...	...	...		...	...	...	...	...	...	...		...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil					
	Ghattal	...	...	...	...	...	...	...	Nil	...	...	0·27	...	...	...	...	0·27	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	0·17	0·17	...	...	...	Nil	0·44	0·57	0·27	0·44	0·57
	Contai	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·36	—	Nil	0·36
	Hooghly District.																																									
	Hooghly	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·15	...	0·15	...	...	...	Nil	0·15	0·45	0·15	0·15	0·45
	Serampore	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	0·09	...	...	...	...	0·13	0·22	...	...	...	Nil	0·22	0·45	0·13	0·22	0·45
	Jehanabad	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·38	—	Nil	0·38
	Howrah District.																																									
	Howrah	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	0·16	...	...	...	...	0·07	0·23	...	...	0·05	0·05	0·28	0·56	0·16	0·28	0·56
	Moheshreka	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·45	—	Nil	0·45
	24-Pergunnahs.																																									
	Saugor Island	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·31	—	Nil	0·31
	Alipore	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	0·02	...	...	...	0·08	...	0·10	...	...	...	Nil	0·10	0·62	0·08	0·10	0·62
	Busseerhat	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	0·08	...	...	...	...	...	...	0·08	...	...	...	Nil	0·08	0·46	0·08	0·08	0·46
	Baraset	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	0·30	...	...	...	...	0·12	0·42	...	...	...	Nil	0·42	0·49	0·30	0·42	0·49
	Diamond Harbour	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	0·10	...	...	...	...	...	0·10	...	...	...	Nil	0·11	0·44	0·10	0·11	0·44
	Barripore†	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...																		
	Barrackpore	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	0·11	...	...	...	...	0·07	0·18	...	...	...	Nil	0·18	0·43	0·11	0·18	0·43
	Dum-Dum	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	0·53	0·53	...	...	0·01	0·01	0·53	0·42	0·53	0·53	0·42
	Nuddea District.																																									
	Kishnaghur	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·46	—	Nil	0·46
	Bongong	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·33	—	Nil	0·33
	Meherpore	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·08	0·15	0·23	...	...	...	Nil	0·23	0·32	0·15	0·23	0·32
	Chopadanga	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	0·04	0·04	...	...	...	Nil	0·04	0·34	0·04	0·04	0·34
	Kooshtea	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	0·32	...	...	...	...	0·20	0·52	...	...	...	Nil	0·52	0·40	0·32	0·52	0·40
	Ranaghat	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	0·08	...	0·08	0·08	0·48	0·08	0·08	0·48

Table of Rainfall recorded at Stations in Bengal in January 1883—continued.

Divisions.	Stations.	First week. 1	2	3	4	5	6	7	Total rainfall of the week.	Second week. 8	9	10	11	12	13	14	Total rainfall of the week.	Third week. 15	16	17	18	19	20	21	Total rainfall of the week.	Fourth week. 22	23	24	25	26	27	28	Total rainfall of the week.	Last three days. 29	30	31	Total rainfall of the last three days.	Total rainfall for the month.	Average rainfall for the month.	Heaviest rainfall during the month.	Total rainfall from 1st January 1883 up to 31st January 1883.	Average rainfall from 1st January up to 31st January 1883.
	Bengal—*contd.*																																									
	Jessore District.																																									
Presidency—*concluded.*	Jessore								Nil								Nil								Nil		0·30					0·15	0·45				Nil	0·45	0·49	0·30	0·45	0·49
	Narail								Nil								Nil								Nil		0·02					0·11	0·13				Nil	0·13	0·79	0·11	0·13	0·79
	Jhenida								Nil								Nil								Nil								Nil				Nil	Nil	0·36	—	Nil	0·36
	Magoora								Nil								Nil								Nil			0·02					0·02				Nil	0·02	0·35	0·02	0·02	0·35
	Khoolna District.																																									
	Khoolna								Nil								Nil								Nil			0·08					0·08				Nil	0·08	0·68	0·08	0·08	0·68
	Bagirhat								Nil								Nil								Nil								Nil				Nil	Nil	0·61	—	Nil	0·61
	Satkhira								Nil								Nil								Nil		0·11						0·11				Nil	0·11	0·42	0·11	0·11	0·42
	Moorshedabad District.																																									
	Berhampore								Nil								Nil								Nil						0·05	0·07	0·12				Nil	0·12	0·44	0·07	0·12	0·44
	Lalbagh								Nil								Nil								Nil								Nil				Nil	Nil	0·51	—	Nil	0·51
	Jungypore								Nil								Nil								Nil			0·38			0·03		0·41				Nil	0·41	0·48	0·34	0·41	0·48
	Azimgunge								Nil			0·02					0·02								Nil		0·01	0·04			0·03	0·05	0·13				Nil	0·15	0·57	0·05	0·15	0·57
	Lalgola								Nil								Nil								Nil		0·34				0·05		0·39				Nil	0·39	0·76	0·34	0·39	0·76
	Kandi								Nil								Nil								Nil						0·07		0·07				Nil	0·07	0·35	0·07	0·07	0·35
	Dinagepore District.																																									
	Dinagepore								Nil			0·04					0·04								Nil					0·29	0·48		0·77			0·03	0·03	0·84	0·28	0·48	0·84	0·28
	Raigunge								Nil								Nil								Nil						0·58		0·58			0·02	0·02	0·60	0·59	0·58	0·60	0·59
	Mohadebpore								Nil								Nil								Nil			0·22			0·05	0·11	0·38				Nil	0·38	0·29	0·22	0·38	0·29
	Choorsmun								Nil								Nil								Nil						0·42		0·42	0·10			0·10	0·52	0·27	0·42	0·52	0·27
	Baloorghat								Nil								Nil								Nil		0·17				0·22	0·19	0·58				Nil	0·58	?	0·22	0·58	?
	Maldah District.																																									
	Maldah								Nil								Nil								Nil		0·34				0·14		0·48				Nil	0·48	0·70	0·34	0·48	0·70
Rajshahye.	*Rajshahye District.*																																									
	Bauleah								Nil								Nil								Nil			0·22			0·05	0·09	0·36				Nil	0·36	0·30	0·22	0·36	0·30
	Nattore								Nil								Nil								Nil			0·50				0·20	0·70				Nil	0·70	0·70	0·50	0·70	0·70
	Rungpore District.																																									
	Rungpore								Nil								Nil								Nil						0·50		0·50				Nil	0·50	0·39	0·50	0·50	0·39
	Bhabanigunge								Nil								Nil								Nil							0·55	0·55				Nil	0·55	0·38	0·55	0·55	0·38
	Kurigram								Nil								Nil								Nil						0·52	0·07	0·59				Nil	0·59	0·45	0·52	0·59	0·45
	Bagdogra								Nil								Nil								Nil								Nil				Nil	Nil	0·21	—	Nil	0·21
	Bogra District.																																									
	Bogra								Nil								Nil								Nil			0·23			0·25	0·10	0·58				Nil	0·58	0·47	0·25	0·58	0·47
	Sherpore								Nil								Nil								Nil			0·20			0·12	0·08	0·40				Nil	0·40	0·37	0·20	0·40	0·37
	Nowkhila								Nil								Nil								Nil			0·30			0·04	0·34	0·68				Nil	0·68	0·44	0·34	0·68	0·44
	Panchabibi								Nil								Nil								Nil							0·45	0·45				Nil	0·45	0·38	0·45	0·45	0·38
	Pubna District.																																									
	Pubna								Nil								Nil								Nil			0·28				0·22	0·50				Nil	0·50	0·40	0·28	0·50	0·40
	Serajgunge								Nil								Nil								Nil							0·65	0·65				Nil	0·65	0·49	0·65	0·65	0·49
	Darjeeling District.																																									
	Darjeeling								Nil	0·05							0·05								Nil					0·21		1·60	1·81				Nil	1·86	0·72	1·60	1·86	0·72
	Kalimpong								Nil								Nil								Nil					0·31	1·81		2·12				Nil	2·12	?	1·81	2·12	?

JULPIGOREE.	Julpigoree ...	...	...	...	...	...	...	...	Nil	...	...	...	0·15	...	...	...	0·15	...	...	...	...	...	...	...	Nil	...	...	0·52	...	...	0·66	...	1·18	...	...	...	Nil	1·33	0·45	0·66	1·33	0·45
	Boxa ...	...	...	...	...	...	...	...	Nil	...	...	...	...	0·20	...	...	0·20	...	...	...	...	...	...	...	Nil	...	0·17	0·32	...	...	0·60	0·25	1·34	...	...	...	Nil	1·54	0·93	0·60	1·54	0·93
	Cooch Behar Tributary States.																																													
COOCH BEHAR.	Cooch Behar ...	...	...	...	...	...	...	0·01	0·61	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	0·05	0·12	...	0·17	...	...	...	Nil	0·18	0·39	0·12	0·18	0·39
	Dinhatta ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·40	0·01	0·41	...	...	...	Nil	0·41	0·46	0·40	0·41	0·46
	Matabhanga ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·32	...	0·32	...	...	...	Nil	0·32	0·25	0·32	0·32	0·25
	Meekliganje ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·27	...	0·37	...	...	...	Nil	0·37	0·10	0·37	0·37	0·10
DACCA.	*Dacca District.*																																													
	Dacca ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·11	...	...	...	0·15	0·26	...	...	...	Nil	0·26	0·29	0·15	0·26	0·29
	Moonshigunge ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·36	...	...	...	0·62	0·98	...	...	...	Nil	0·98	0·63	0·62	0·98	0·63
	Manickgunge ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·45	...	...	...	0·20	0·65	...	...	...	...	0·65	0·52	0·45	0·65	0·52
	Furreedpore District.																																													
	Furreedpore ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·50	...	...	...	0·13	0·63	...	...	...	Nil	0·63	0·34	0·50	0·63	0·34
	Goalundo‡ ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...									0·14				Nil					
	Madaripore ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	0·04	0·04	...	...	...	Nil	0·04	0·67	0·04	0·04	0·67
	Backergunge District.																																													
	Burrisal ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·61	—	Nil	0·61
	Perozepore ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·53	—	Nil	0·53
	Patuakhally ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·59	—	Nil	0·59
	Bhola ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·33	—	Nil	0·33
	Mymensingh District.																																													
	Mymensingh ...	...	...	...	...	...	...	...	Nil	...	...	...	0·06	...	...	...	0·06	...	...	...	...	...	...	...	Nil	...	...	0·07	...	...	...	0·35	0·42	...	...	...	Nil	0·48	0·37	0·35	0·48	0·37
	Jamalpore ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·38	...	...	...	0·44	0·82	...	...	...	Nil	0·82	0·48	0·44	0·82	0·48
	Atia ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·06	...	...	...	0·16	0·22	...	...	...	Nil	0·22	0·39	0·16	0·22	0·39
	Kishoregunge ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·02	...	...	...	0·05	0·07	...	...	...	Nil	0·07	0·67	0·05	0·07	0·67
	Nitrokona ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	?	—	Nil	?
	Chittagong District.																																													
CHITTAGONG.	Chittagong ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·44	—	Nil	0·44
	Cox's Bazar ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·47	—	Nil	0·47
	Noakholly District.																																													
	Noakholly ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·47	—	Nil	0·47
	Fenny ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·67	—	Nil	0·67
	Tipperah District.																																													
	Commillah ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·19	...	...	...	...	0·19	...	...	...	Nil	0·19	0·64	0·19	0·19	0·64
	Chandpore ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	0·25	...	...	...	0·25	...	...	...	Nil	0·25	0·43	0·25	0·25	0·43
	Brahmunberiah ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·30	...	...	...	0·32	0·62	...	...	...	Nil	0·62	0·82	0·32	0·62	0·82
	Chittagong Hill Tracts.																																													
	Rungamatee Hill ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	0·43	...	Nil	0·43
	Ruma ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	Nil	Nil	?	...	Nil	?
	Hill Tipperah District.																																													
	Agurtola ...	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	0·45	0·45	...	...	...	Nil	0·45	0·93	0·45	0·45	0·93

Table of Rainfall recorded at Stations in Bengal in January 1883—concluded.

Divisions.	Stations.	First week. 1	2	3	4	5	6	7	Total rainfall of the week.	Second week. 8	9	10	11	12	13	14	Total rainfall of the week.	Third week. 15	16	17	18	19	20	21	Total rainfall of the week.	Fourth week. 22	23	24	25	26	27	28	Total rainfall of the week.	Last three days. 29	30	31	Total rainfall of the last three days.	Total rainfall for the month.	Average rainfall for the month.	Heaviest rainfall during the month.	Total rainfall from 1st January 1883 up to 31st Jan. 1883.	Average rainfall from 1st January up to 31st Jan. 1883.
	Behar.																																									
	Patna District.																																									
Patna	Patna	...	...	...	...	...	...	...	Nil	...	0·59	...	...	...	...	...	0·59	...	...	...	...	...	...	...	Nil	...	...	...	...	...	1·01	...	1·34	...	...	...	Nil	1·93	0·72	1·01	1·93	0·72
	Behar	...	...	...	...	...	...	...	Nil	...	0·35	...	...	...	...	...	0·35	...	...	...	...	...	...	...	Nil	...	...	0·09	0·02	0·33	0·90	...	1·07	...	...	...	Nil	1·42	0·56	0·90	1·42	0·56
	Barh	...	...	...	...	...	...	...	Nil	...	...	0·31	...	...	...	...	0·31	...	...	...	...	...	...	...	Nil	...	...	...	...	0·06	0·75	0·06	0·85	...	...	...	Nil	1·16	0·59	0·75	1·16	0·59
	Dinapore	...	...	...	...	...	...	...	Nil	...	0·15	...	...	...	...	...	0·15	...	...	...	...	...	...	...	Nil	...	...	...	...	0·04	1·00	...	1·00	...	...	...	Nil	1·15	0·57	1·00	1·15	0·57
	Gya District.																																									
	Gya	...	...	...	...	...	...	...	Nil	...	0·02	0·38	...	...	...	...	0·40	...	...	...	...	...	...	...	Nil	...	0·02	...	0·02	0·05	1·16	...	1·25	...	...	...	Nil	1·65	0·70	1·16	1·65	0·70
	Nowadah	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·35	1·95	...	0·82	...	3·12	...	...	...	Nil	3·12	0·61	1·95	3·12	0·61
	Aurungabad	...	...	...	...	...	...	...	Nil	...	0·09	0·12	...	...	...	...	0·21	...	...	...	...	...	...	...	Nil	...	0·04	...	...	...	0·91	...	0·95	...	...	...	Nil	1·16	0·53	0·91	1·16	0·53
	Jehanabad	...	...	...	...	...	...	...	Nil	0·20	...	...	...	...	...	...	0·20	...	...	...	...	...	...	...	Nil	...	...	...	...	0·50	1·17	...	1·67	...	...	...	Nil	1·87	0·71	1·17	1·87	0·71
	Shahabad District.																																									
	Arrah	...	...	...	...	...	...	...	Nil	...	0·38	0·07	...	...	...	...	0·45	...	...	...	...	...	...	...	Nil	...	...	...	...	0·42	1·02	...	1·44	...	...	...	Nil	1·89	0·88	1·02	1·89	0·88
	Sasseram	...	...	...	...	...	...	...	Nil	...	0·54	...	...	...	...	...	0·54	...	...	...	...	...	...	...	Nil	...	...	...	0·11	0·77	...	...	0·88	...	...	0·04	0·04	1·46	0·46	0·77	1·46	0·46
	Buxar	...	...	...	...	...	...	...	Nil	...	0·44	...	...	...	...	...	0·44	...	...	...	...	...	...	...	Nil	...	...	0·07	...	0·12	0·84	...	1·03	...	...	...	Nil	1·47	0·81	0·84	1·47	0·81
	Bhuboosh	...	...	...	...	...	...	...	Nil	...	0·40	...	...	...	...	...	0·40	...	...	...	...	...	...	...	Nil	...	...	0·20	0·80	...	...	...	1·00	...	0·20	...	0·20	1·60	0·71	0·80	1·60	0·71
	Mozufferpore District																																									
	Mozufferpore	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·04	...	0·61	1·13	...	1·78	...	...	...	Nil	1·78	0·92	1·13	1·78	0·92
	Hajeepore	...	...	...	...	...	...	...	Nil	...	...	0·22	...	...	...	...	0·22	...	...	...	...	...	...	...	Nil	...	...	...	...	0·26	0·98	...	1·24	...	...	...	Nil	1·46	0·66	0·98	1·46	0·66
	Seetamurhee	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·04	...	0·82	1·02	...	1·88	...	...	...	Nil	1·88	0·62	1·02	1·88	0·62
	Durbhunga District.																																									
	Durbhunga	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	0·29	0·62	...	0·91	...	...	...	Nil	0·91	0·47	0·62	0·91	0·47
	Mudhoobunny	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	0·69	0·84	...	1·53	...	...	...	Nil	1·53	0·77	0·84	1·53	0·77
	Tajpore	...	...	...	...	...	...	...	Nil	...	0·15	...	...	...	...	...	0·15	...	...	...	...	...	...	...	Nil	...	...	...	...	0·15	0·62	...	0·77	...	...	...	Nil	0·92	0·67	0·62	0·92	0·67
	Sarun District.																																									
	Chupra	...	...	...	...	...	...	...	Nil	...	0·32	...	...	...	...	...	0·32	...	...	...	...	...	...	...	Nil	...	...	...	...	0·28	0·83	...	1·11	...	...	...	Nil	1·43	0·70	0·83	1·43	0·70
	Sewan	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	0·30	...	...	1·19	0·57	...	2·06	...	...	...	Nil	2·06	0·77	1·19	2·06	0·77
	Gopalgunge	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	0·05	...	1·44	1·20	...	2·69	...	...	...	Nil	2·69	0·54	1·44	2·69	0·54
	Chumparun District.																																									
	Motiharee	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	2·21	...	0·55	0·96	...	1·72	...	...	...	Nil	1·72	0·48	0·96	1·72	0·48
	Bettiah	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	3·06	1·20	...	4·26	...	...	...	Nil	4·26	0·80	3·06	4·26	0·80
	Monghyr District.																																									
	Monghyr	...	...	...	...	...	...	...	Nil	...	0·12	...	...	...	...	...	0·12	...	...	...	...	...	...	...	Nil	...	...	...	...	0·25	0·25	...	0·50	...	...	...	Nil	0·62	0·40	0·25	0·62	0·40
	Begooserai	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	0·11	0·44	...	0·55	...	...	...	Nil	0·55	0·46	0·44	0·55	0·46
	Jamooee	...	...	...	...	...	...	...	Nil	...	...	0·30	...	...	...	...	0·30	...	...	...	...	...	...	...	Nil	...	0·45	...	...	...	0·39	...	0·92	...	...	...	Nil	1·22	0·69	0·45	1·22	0·69
	Bhagulpore District.																																									
	Bhagulpore	...	...	...	...	...	...	...	Nil	...	...	0·09	...	...	...	...	0·09	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·39	0·05	0·44	...	...	...	Nil	0·53	0·49	0·39	0·53	0·49
	Soopole	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	0·20	0·61	...	0·81	...	...	...	Nil	0·81	0·39	0·61	0·81	0·39
	Muddehpoora	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	...	...	Nil	...	...	...	...	...	0·67	...	0·67	...	...	...	Nil	0·67	0·42	0·67	0·67	0·42
	Banka	...	...	...	...	...	...	...	Nil	...	...	0·37	...	...	...	...	0·37	...	...	...	...	...	...	...	Nil	...	...	0·24	...	...	0·40	...	0·64	...	...	...	Nil	1·01	0·61	0·40	1·01	0·61

BHAGULPORE.																																								
Purneah District.																																								
Purneah	Nil												Nil								Nil								0·95	0·01	0·96				Nil	0·96	0·38	0·95	0·96	0·38
Kissengunge	Nil												Nil								Nil								0·85	0·07	0·92				Nil	0·92	0·52	0·85	0·92	0·52
Arrareah	Nil												Nil								Nil								[illegible]		0·85				Nil	0·85	0·34	0·85	0·85	0·34
Sonthal Pergunnahs District.																																								
Nya Doomka	Nil										0·40					0·40									Nil						Nil				Nil	0·40	0·53	0·40	0·40	0·53
Rajmehal	Nil															Nil									Nil		0·22			0·10	0·36		0·68				Nil	0·68	0·16	0·36	0·68	0·16
Deoghur	Nil										0·51					0·51									Nil			0·37			0·40		0·83				Nil	1·34	0·43	0·51	1·34	0·43
Jamtara	Nil										0·84					0·84									Nil						0·09		0·09				Nil	0·93	0·28	0·84	0·93	0·28
Pakour	Nil															Nil									Nil					0·30			0·30				Nil	0·30	0·24	0·30	0·30	0·24
Godda	Nil															Nil									Nil		0·66				0·61		1·27				Nil	1·27	0·32	0·66	1·27	0·32
ORISSA.																																								
Cuttack District.																																								
Cuttack	Nil												Nil								Nil										Nil				Nil	Nil	0·40		Nil	0·40
Jajpore	Nil												Nil								Nil										Nil				Nil	Nil	0·43		Nil	0·43
Kendrapara	Nil												Nil								Nil										Nil				Nil	Nil	0·44		Nil	0·44
Jagatsingpore	Nil												Nil								Nil										Nil				Nil	Nil	0·24		Nil	0·24
False Point	Nil									0·08			0·08								Nil									0·04	0·04				Nil	0·12	0·41	0·08	0·12	0·41
Hookeytollah	Nil												Nil								Nil										Nil				Nil	Nil	?		Nil	?
Banki	Nil												Nil								Nil										Nil				Nil	Nil	?		Nil	?
Pooree District.																																								
Pooree	Nil												Nil								Nil									0·04	0·04				Nil	0·04	0·24	0·04	0·04	0·24
Khurdah	Nil												Nil								Nil										Nil				Nil	Nil	0·31		Nil	0·31
Banpore	Nil												Nil								Nil								0·15		0·15				Nil	0·15	0·10	0·15	0·15	0·10
Balasore District.																																								
Balasore	Nil												Nil								Nil										Nil				Nil	Nil	0·76		Nil	0·76
Bhuddruck	Nil												Nil								Nil										Nil				Nil	Nil	0·38		Nil	0·38
Jellasore	Nil												Nil								Nil										Nil				Nil	Nil	0·89		Nil	0·89
Sorah	Nil										0·10		0·10								Nil										Nil				Nil	0·10	0·28	0·10	0·10	0·28
Chandbally	Nil										0·12		0·12								Nil										Nil				Nil	0·12	0·32	0·12	0·12	0·32
Bareepudda	Nil										0·05		0·05								Nil								0·03		0·03				Nil	0·08	0·32	0·05	0·08	0·32
CHOTA NAGPORE.																																								
Hazaribagh District.																																								
Hazaribagh	Nil										0·14		0·14								Nil		0·10						0·87		0·97				Nil	1·11	0·48	0·87	1·11	0·48
Pachamba	Nil										0·60		0·60								Nil								0·20		0·20				Nil	0·80	0·39	0·60	0·80	0·39
Seetagurh	Nil									0·10			0·10								Nil								0·62		0·62				Nil	0·72	0·27	0·62	0·72	0·27
Mowdie Hills†	Nil									0·20			0·20																											
Jhoonerah Hills	Nil															Nil									Nil				0·40		0·40				Nil	0·40	?	0·40	0·40	?
Lohardugga District.																																								
Ranchee	Nil										0·23		0·23								Nil								0·32		0·32				Nil	0·55	0·79	0·32	0·55	0·79
Palamow	Nil									0·58	0·38		0·96								Nil		0·02			0·36		0·80		1·18				Nil	2·14	0·58	0·80	2·14	0·58
Singbhoom District.																																								
Chyebassa	Nil										1·42		1·42								Nil								0·11		0·11				Nil	1·53	0·79	1·42	1·53	0·79
Manbhoom District.																																								
Purulia	Nil										0·18		0·18								Nil								0·18		0·18				Nil	0·36	0·39	0·18	0·36	0·39
Gobindpore	Nil										0·72		0·72								Nil								0·07		0·07				Nil	0·79	0·57	0·72	0·79	0·57

* Not received from 7th—13th January 1883. | ‡ Not received from 21st—27th January 1883. | † Not received from 21st—31st January 1883.

Errata to the Monthly Rainfall Tables of 1882.

January 1882	...	Hooghly	5th	...	*For*	Nil	...	*Read*	0·03
February ,,	...	Maldah	11th	...	,,	,,	...	,,	0·05
March ,,	...	Mymensingh	18th	...	,,	,,	...	,,	0·03
,, ,,	...	Pooree	17th	...	,,	0·05	...	,,	Nil
April ,,	...	Midnapore	30th	...	,,	Nil	...	,,	0·65

Rangamatee Hills ... May 7th—0·16; 8th—0·17; 9th— ... ; 10th— ... ; 11th—0·43; 12th—0·01; 13th—0·01
Ruma ... ... ,, ,, 0·72; ,, 0·20; ,, ... ; ,, — ... ,, —0·15; ,, — ... ; ,, —0·22
,, ... Monthly Total ... 6·43

Errata—Rainfall Table I of 1882.	Hooghly	January ...	*For*	Nil	*Read*	0·03	*For*	*Total*	50·90	*read*	50·93
Do. — III ditto ...	Ditto	ditto ...	,,	—0·47	,,	—0·44	,,	,,	—9·04	,,	—9·01
Do. — I ditto ...	Maldah	February ...	,,	0·78	,,	0·83	,,	,,	32·64	,,	32·69
Do. — III ditto ...	Ditto	ditto ...	,,	—0·07	,,	—0·02	,,	,,	—21·47	,,	—21·42
Do. — I ditto ...	Mymensingh ...	March ...	,,	3·95	,,	3·98	,,	,,	83·57	,,	83·60
Do. — III ditto ...	Ditto	ditto ...	,,	+1·93	,,	+1·96	,,	,,	—12·41	,,	—12·38
Do. — I ditto ...	Midnapore	April ...	,,	2·48	,,	3·13	,,	,,	60·74	,,	61·39
Do. — II ditto ...	Ditto	ditto ...	,,	1·63	,,	1·66	,,	,,	58·04	,,	58·07
Do. — III ditto ...	Ditto	ditto ...	,,	+0·85	,,	+1·47	,,	,,	+2·70	,,	+3·32
Do. — I ditto ...	Alipore Jail	May ...	,,	6·27	,,	5·37	,,	,,	57·61	,,	56·91
Do. — II ditto ...	Ditto	ditto ...	,,	5·65	,,	5·59	,,	,,	63·39	,,	63·31
Do. — III ditto ...	Ditto	ditto ...	,,	+0·62	,,	—0·02	,,	,,	—5·76	,,	—6·40
Do. — I ditto ...	Rangamattee Hills	ditto ...	,,	10·92	,,	10·41	,,	,,	94·12	,,	93·61
Do. — II ditto ...	Ditto ...	ditto ...	,,	9·71	,,	9·68	,,	,,	98·92	,,	98·89
Do. — III ditto ...	Ditto ...	ditto ...	,,	+1·21	,,	+0·73	,,	,,	—4·80	,,	—5·28

METEOROLOGICAL OFFICE, BENGAL,
The 19th February 1883.

JOHN ELIOT,
Meteorological Reporter to the Government of Bengal.

Results of the Thermometrical Observations taken at the Meteorological Office, Chowringhee, from 18th to 24th February 1883.

Month.	Date.	Temperature.				Hygrometry.				Rain.
		Mean.	Maximum.	Range.	Minimum.	Mean wet bulb.	Vapour tension.	Dew point.	Humidity.	
1883.		°	°	°	°	°	Inches.	°	%	Inches.
February ...	18th ...	71·3	85·3	24·4	60·9	65·4	·549	61·6	71	Nil.
" ...	19th ..	73·4	88·5	27·6	60·9	65·7	·530	60·6	64	"
" ...	2 th ...	78·6	91·9	23·2	68·7	70·1	·623	65·2	63	"
" ...	21st ...	77·7	90·8	22·0	68·8	72·9	·742	70·3	79	"
" ...	22nd ...	75·3	89·4	22·5	66·9	62·6	·399	58·8	46	"
" ...	23rd ...	73·9	90·6	27·7	62·9	59·5	·318	46·6	38	"
" ...	24th ...	72·5	85·8	25·6	60·2	60·6	·371	50·6	46	"

	°
The mean temperature of the seven days	74·7
The extreme variation of temperature during the seven days	31·7
The maximum temperature during the seven days	91·9
	%
The mean relative humidity during the seven days	58
	Inches.
The total fall of rain from 18th to 24th February 1883	Nil.

The mean temperature and humidity are obtained by applying to the mean of the 10h, 16h, and minimum readings a correction dependent on the range, and derived from the hourly observations at the Surveyor-General's Office, Chowringhee, in past years.

METEOROLOGICAL OFFICE, INDIA,
The 26th February 1883.

HENRY F. BLANFORD,
Meteorological Reporter to the Govt. of India.

Report of Fluctuation of Traffic on the Tirhoot State Railway for the month of January 1883.

THE total quantity of goods carried during the month of January 1883 aggregated maunds 3,09,000 as compared with maunds 2,30,950 carried during the corresponding period of 1882, and maunds 1,91,056 carried during the previous month, showing an increase of maunds 78,050 and 1,17,944 respectively.

Of the several increases and decreases, the following are the most prominent ones and worthy of special notice:—

INCREASE.

Coal ... ... Mds. 13,230

This large increase is principally due to heavy despatches to Durbhanga for the Civil Buildings and to the Eastern and Western Extensions for brick burning

Food-grains ... ... Mds 4,724

The brisk trade has been done during the month in oats to Calcutta.

Hides and Horns ... ... Mds. 2,456

During the first half of the month there was a brisk demand for Durbhunga hides, and very favourable rates for despatches were obtained; but at the close of the month prices declined by about eight annas, and despatches fell off somewhat, or the increase would have been much larger.

Indigo ... ... Mds. 3,314

The increase under this head is explained in last month's traffic report.

Piece-goods ... ... Mds. 3,207

A total weight of 12,783 maunds of this class of traffic has been carried during the month against 9,576 maunds for the corresponding month of last year—a result that must be looked upon as satisfactory.

Railway materials ... ... Mds. 18,116

Permanent-way material is still being pushed forward for the extensions.

Salt ... ... Mds. 25,998

Prices have been easier at the port, and dealers have, no doubt, taken advantage of the opportunity to supply the up-country golahs.

Saltpetre ... ... Mds.

The demand in Calcutta for shipment has been brisk during the month under review, and prices have been good—both causes likely to stimulate despatches.

Tobacco ... ... Mds. 2,822

As anticipated in November's report, an increased traffic, under this head is still being carried.

DECREASE.

Lime and kunker ... ... Mds. 7,913

This is a fluctuating traffic, and depends entirely on building or road operations

TRAFFIC DEPARTMENT.

Statement showing Increases and Decreases in Maundage of principal Staples carried over the Line during the month of January 1883 as compared with the corresponding period of 1882.

STAPLES.	1883.		1882.		Total.		Increase.	Decrease.
	Up.	Down.	Up.	Down.	1883.	1882.		
Coal	39,398	.....	25,448	720	39,398	26,168	13,230	.....
Food-grains	12,802	35,955	4,680	39,353	48,757	44,033	4,724	.....
Ghee	.....	1,766	.....	1,546	1,766	1,546	220	.....
Gunny-bags (empty)	606	383	776	371	989	1,147	.....	158
Hides and horns	.....	7,159	15	4,688	7,159	4,703	2,456	.....
Indigo	7	5,520	.....	2,213	5,527	2,213	3,314	.....
Iron	3,542	76	3,440	283	3,618	3,723	.....	105
Lime and kunkur	3,060	.....	10,866	107	3,060	10,973	.....	7,913
Piece-goods	12,723	60	8,397	1,179	12,783	9,576	3,207	.....
Railway materials	32,261	10,257	21,037	3,365	42,518	24,402	18,116	.....
Salt	35,960	4,834	13,089	1,707	40,794	14,796	25,998	.....
Saltpetre	.....	12,591	.....	6,292	12,591	6,292	6,299	.....
Seeds	29,706	12,773	32,162	7,495	42,479	39,657	2,822	.....
Tobacco	32	5,917	268	5,504	5,949	5,772	177	.....
All other goods	17,397	24,215	21,654	14,295	41,612	35,949	5,663	.....
Total ...	1,87,494	1,21,596	1,41,832	89,118	3,09,000	2,30,950	86,226	8,176
					2,30,950		8,176	
Increase ...					87,050		78,050	

G. M. DRURY, *Traffic Superintendent.*

Weekly Return of Traffic Receipts on Indian Railways.

EAST INDIAN RAILWAY.

Approximate Return of Traffic for week ended 17th February 1883 on 1,506¾ miles open.

	Coaching Traffic.		Merchandise and Mineral Traffic.		Other earnings (estimated).	Total earnings.	Total Train-miles run.		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. s.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week	202,563	2,48,912 4 0	25,17,942 10	7,07,530 1 3	18,396 0 8	9,74,838 5 11	68,926½	130,789	199,715½
Or per mile of railway	.....	165 3 2	.....	469 9 2	12 3 4	646 15 8	.....	.....	.....
For previous 6 weeks of half-year	1,133,553	14,79,703 1 0	1,40,66,633 0	36,83,039 4 3	1,21,804 0 9	52,34,546 6 0	395,165	678,110	1,073,275
Total for 7 weeks ...	1,336,116	17,28,615 5 0	1,65,83,675 10	43,90,569 5 6	1,40,200 1 5	62,59,384 11 11	464,091½	808,899	1,272,990½
Comparison.									
Total for corresponding week of previous year	183,874	2,58,937 11 11	24,84,835 0	7,29,774 1 9	23,996 5 5	10,12,708 3 1	50,989	130,406	181,395
Per mile of railway corresponding week of previous year ..	.....	171 13 7	.....	484 5 5	15 14 10	672 1 10	.....	.....	.....
Total to corresponding date of previous year	1,692,816	28,37,317 12 6	1,64,08,001 20	50,78,292 5 8	1,35,196 1 7	80,50,806 3 4	413,258	863,286	1,276,544

EASTERN BENGAL RAILWAY.

Approximate Return of Traffic for week ended 17th February 1883 on 192½ miles open.

	Coaching Traffic.		Merchandise and Mineral Traffic.		Other earnings (estimated)	Total earnings.	Total Train-miles run.		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. s.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week ..	47,056	35,425 0 0	3,10,342 0	69,952 0 0	417 0 0	1,05,794 0 0	6,285	8,977¾	15,262¾
Or per mile of railway	244	184 0 5	1,611 36	363 6 2	2 2 8	549 9 3	.....	.....	.....
For previous 6 weeks of half-year	307,304	1,99,936 0 0	17,05,136 0	3,50,120 0 0	863 0 0	5,50,919 0 0	31,068½	40,494	71,562½
Total for 7 weeks ...	354,360	2,35,361 0 0	20,15,478 0	4,20,072 0 0	1,280 0 0	6,56,713 0 0	37,353½	49,471¾	86,825¼
Comparison									
Total for corresponding week of previous year...	40,085	32,277 0 0	2,54,292 0	45,185 0 0	1,006 0 0	78,468 0 0	6,070½	6,625	12,695½
Per mile of railway, corresponding week of previous year ..	233	187 14 11	1,480 24	263 1 5	5 13 8	456 14 0	.....	.....	.....
Total to corresponding date of previous year	327,447	2,25,322 0 0	18,13,779 0	3,30,117 0 0	1,949 0 0	5,57,388 0 0	41,808½	52,395½	94,204

Includes Rs. 124 on account of Revenue stores.

BENGAL PROVINCIAL RAILWAYS.

Weekly Statement of Traffic Receipts.

Latest return received.	Name of Railway.	Length open.	Receipts for week ending		Total receipts from 1st January		Total increase in 1883.	Total decrease in 1883.	Percentage of increase or decrease.
			14th Jan. 1882.	13th Jan. 1883.	To 14th Jan. 1882.	To 13th Jan. 1883.			
1883.		Miles.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs.	Rs.
20th January ...	Northern Bengal ...	230	67,747 0 0	71,046 0 0	67,747 0 0	71,046 0 0	3,299 0 0	.....	5
13th " ...	Tirhoot	85	20,980 0 0	23,349 0 0	20,980 0 0	23,349 0 0	2,369 0 0	.....	11
20th " ...	Patna-Gya	57	19,721 0 0	21,664 0 0	19,721 0 0	21,664 0 0	1,943 0 0	.....	10
13th " ...	Calcutta and South-Eastern	43	5,276 0 0	6,786 0 0	5,276 0 0	6,786 0 0	1,510 0 0	.....	29
	Nalhati	27¼	2,795 0 0	2,499 0 0	2,795 0 0	2,499 0 0	.....	296	11
	Total ...	442¼	1,16,519 0 0	1,25,344 0 0	1,16,519 0 0	1,25,344 0 0	8,825 0 0	.....	7

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[REGISTERED No. 29.]

No. 10 of 1883.

SUPPLEMENT TO

The Calcutta Gazette.

WEDNESDAY, MARCH 7, 1883.

OFFICIAL PAPERS.

Non-Subscribers to the GAZETTE *may receive the* SUPPLEMENT *separately on payment of Six Rupees per annum if delivered in Calcutta, or Twelve Rupees if sent by Post.*

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ANNUAL REPORT ON THE EMPLOYMENT OF NATIVES AS ENGINE-DRIVERS AND SHUNTERS ON THE STATE RAILWAYS IN BENGAL DURING 1882.

No. 1023RE.

Dated Calcutta, the 28th February 1883.

READ—

Government of Bengal, Public Works Department, Railway, No. 243T—RE, dated 29th June 1882.

Government of India, Public Works Department, Railway, No. 625RE, dated 11th September 1882.

Read also—

No. 32E of 8th January 1883, from Manager, Northern Bengal State Railway.

No. 118E of 9th January 1883, from Manager, Calcutta and South-Eastern and Nalhati State Railways.

No. 562 of 20th January 1883, from Manager, Tirhoot and Patna-Gya State Railways.

OBSERVATIONS.—In Resolution No. 243T—RE of the 29th June 1882, noted above, it was stated—"Every effort should therefore be made to induce natives of a fairly good social standing to join the Locomotive Department of the State Railways in this province, with a view to their eventually becoming drivers; and as none should be chosen who cannot read and write, an incentive should be given by granting higher pay to those who are proficient in that respect. Night schools should also be started wherever practicable, and they will receive the cordial support of Government."

2. The reports for the year 1882 shew that some progress has been made in the employment of native drivers on the railways under the orders of this Government.

Northern Bengal State Railway.—Comparing the years 1881 to 1883, the following are the numbers of native drivers, shunters, and assistant shunters employed :—

			1881.	1882.	1883.
Drivers	...	...	3	5	7
Shunters	...	...	1	7	9
Assistant shunters	...	...	7	1	1

The number of men thus employed has increased from 11 in 1881 to 17 in 1883, the rates of salary per month being for shunters Rs. 14 to Rs. 22, and for drivers Rs. 22 to Rs. 38. These men are at first engaged as cleaners and khalassees and are promoted to firemen as vacancies occur; inducements are also held out to them to attend the night school established at Saidpore. When they have had sufficient experience in firing they are promoted to assistant shunters, shunters and drivers, provided they pass an examination in reading and writing, in the rules of the service, and in the technical management of an engine. The Locomotive Superintendent reports that all the men now employed are regular in attendance and careful in the performance of their duties. The attendance at the night school is not so satisfactory as was expected, but steps are being taken to make it more regular in future.

Tirhoot and Patna-Gya State Railways.—Two drivers, three shunters, and one assistant shunter were employed during 1882, against four shunters in 1881. Thus the number of men employed has increased from four in 1881 to six in 1882. The rate of pay averages from Rs. 15 to Rs. 25 for shunters, and Rs. 25 to Rs. 40 for drivers. No proper system had been adopted for training these men, but arrangements have now been made to start a night school at Somastipore, the head-quarters of the Assistant Locomotive Superintendent of the Railway. Natives are at first employed as cleaners and khalassees and promoted to firemen, and when they have passed a satisfactory examination in reading, writing, and technical knowledge of an engine, and have proved themselves fit for promotion, they are promoted to shunters and drivers. The Assistant Locomotive Superintendent reports that they have worked very well and with but few accidents, the chief fault being that they burn excess of coal; steps have, however, been taken to rectify this as far as possible.

Calcutta and South-Eastern and Nalhati State Railways.—All the drivers on these lines are natives, and there are now seven so employed, the rates paid being Rs. 20 to Rs. 40 a month. They are at first tried as firemen, and when they have had sufficient experience in firing they are promoted to shunters and afterwards to drivers, provided they can pass an examination in reading and writing and in the technical management of an engine. The Locomotive Superintendent reports that all these men are working in a fairly satisfactory manner.

RESOLUTION.—The progress made in the employment of native drivers and shunters is considered on the whole satisfactory, the real difficulty still is to obtain men with the necessary qualifications, and to overcome the aversion the men have to attend the night schools provided for them. As a further inducement in this direction, a system of granting prizes for regular attendance at the schools should be introduced. Experience has shewn that, while the employment of native drivers results in a large saving in wages, they are more wasteful of fuel than Europeans, and they have yet to shew that in positions of danger their judgment and presence of mind will stand them in good stead; it is therefore still considered premature to employ them on fast mail trains. They should, however, be employed to the fullest extent on goods trains, and the Lieutenant-Governor trusts that the officers in charge of lines will not relax their efforts to see that this order is carried into effect.

ORDER.—Ordered that copy of this Resolution be forwarded to the Secretary to the Government of India, Public Works Department, for information; also to the Managers of the Northern Bengal, Tirhoot, and the Calcutta and South-Eastern and Nalhati State Railways, for information and guidance.

Ordered also that this Resolution be published in the Supplement to the *Calcutta Gazette* for general information.

By order of the Lieutenant-Governor of Bengal,

H. C. LEVINGE,

Secretary to the Govt. of Bengal,
P. W. Dept.

Rainfall, Weather, and State and Prospects of the Crops.

Statement showing Rainfall, Weather, and State and Prospects of the Crops in the different Districts of Bengal, as reported to Government during the week ending the 3rd March 1883.

No.	District, and date of return.	Rainfall at Sudder Station in inches.	Character of the weather, state and prospects of the crops, and state of health at date.
BENGAL.			
	Western Districts.		
BURDWAN DIVN. 1	Burdwan, Mar. 3 '83	0·9	Weather—hotter. Sugarcane and *rubbee* crops being cut. Public health indifferent.
	Cutwa ...	0·02	
2	Bankoora, „ 3 „	0·14	Weather—fine, with passing clouds. Sugar or *gur* is being manufactured all over the district. Cotton, wheat and gram doing well. General health improving.
	Bishenpore ...	0·49	
	Maliara ...	0·12	
	Khatra ...	0·17	
3	Beerbhoom, „ 3 „	0·01	Weather—seasonable. Cold-weather crops being harvested. Sugar manufacture going on. Price of rice has risen. Public health good.
4	Midnapore „ 3 „	0·52	Weather—cloudy and sometimes foggy at morning. Prospects of *rubbee* crops bettered by the rain generally. Cholera reported from Khorar in the Ghattal sub-division. Public health good in other parts of the district.
	Contai ...	4·73	
	Tumlook .	2·00	
	Ghattal ...	0·80	
5	Hooghly, „ 3 „	0·66	Weather—cloudy and foggy throughout the week. Rain will injure mango crop. Outturn of sugarcane good. A few cases of cholera reported. Public health otherwise good.
	Howrah „ 5 „	2·02*	Unusually heavy rain for the time of year; mornings still cool. Agricultural reports favourable.
	Oolooberia ...	3·38	
	Central Districts.		
PRESIDENCY DIVN. 6	24-Pergunnahs, Mar. 5 „	2·18*	Weather—cool and cloudy, with occasional showers of rain. *Rubbee* crops being gathered, and sugarcane pressed. Public health good.
7	Nuddea, „ 3 „	0·78	Weather—getting warm. Slight clouds with occasional rain. Some of the winter crops are being harvested. Prospects of spring crops favourable. Fever decreasing. Cholera reported in a few places.
	Kooshtea ...	0·04	
	Meherpore ..	0·07	
	Chooadanga ...	0·01	
	Bongong ..	1·30	
8	Khoolna, „ 3 „	2·10	Weather—cloudy, with occasional drizzling. State and prospects of standing crops improved by late rain, which will also enable cultivators to prepare lands for *aus* crop and sugarcane. Public health continues to be good.
9	Jessore, „ 3 „	0·72	Weather—cloudy and warmer. Harvesting of winter crops nearly finished. Spring sowings going on. General health good.
	Magura ..	0·07	
	Narail ...	0·72	
10	Moorshedabad, „ 3 „	0·02	Weather—warm and cloudy at times. Winter crops continue to be satisfactory. They are being cut in some places. *Boro* rice cultivation going on and land being prepared for *bhadoi* rice. A few cases of small-pox reported in some places, and cholera still lingers in thana Shahanagore.
RAJSHAHYE AND COOCH BEHAR DIVN. 11	Dinagepore, Mar. 2 '83	0·03	Weather—cloudy at intervals. Pulses doing well. Sugarcane still being cut. Transplanting of *boro* paddy still continues. Rice selling at from 20 to 28 seers per rupee.
12	Rajshahye, „ 3 „	0·03	Weather—cloudy and slight showers in parts of district. Ploughing now being vigorously carried on. Outturn of spring crops fair.
13	Rungpore „ 2 „	0·08	Weather—yet uncertain and at times cloudy. Prospects of tobacco, wheat, *kaon*, and *cheena* good. Early rice being sown in some places. Public health good.
14	Bogra, „ 3 „	0·16	A couple of showers made the weather quite cold for a few days. Crops doing fairly well. Public health generally good. Cholera and chicken-pox reported from Bogra thana, and a few cases of fever from Shariakandi and Panchbibi thanas.
15	Pubna, „ 3 „	0·12	Slight rain all over district. Mornings misty. Weather continues cool. State of crops good.
16	Darjeeling, „ 3 „	Slight rain.	Weather—fine in early part of week. Cloudy during the last few days. Wheat and barley coming on well. Prospects good.
17	Julpigoree, „ 3 „	0·12	Weather—clear at the beginning of week. Cloudy towards the end, with generally a strong wind during the day. Land being ploughed for *bhadoi* paddy. Standing crops doing well.
	Cooch Behar, „ 2 „	0·02	Weather—warmer. Cloudy towards end of week. Prospects of all crops continue good. Cattle-disease appears prevalent in Dinhatta. Public health good.
	Eastern Districts.		
DACCA DIVN. 18	Dacca Mar. 3 '83	0·19	Weather—growing warm. Sugarcane-pressing in full progress. Harvesting of mustard-seed continues. Prospects of other standing crops good.
	Manickgunge ...	0·01	
	Munshigunge ...	0·16	
19	Furreedpore, „ 3 „	1·83	Weather—cloudy. Copious showers of rain on 1st and 2nd. *Aus* and *til* being sown. Rain has done good to standing crops. General health good.
	Goalundo ...	1·16	
	Madaripore ...	0·54	
20	Backergunge, „ 1 „	1·70	Weather—cooler than last week. Cloudy and rainy occasionally. Outturn of *amun* rice good. General health good.
21	Mymensingh, „ 2 „	0·35	Weather—cloudy and warm. Slight rain fell on 25th and 26th ultimo. State and prospects of crops good. Public health generally good. A few cases of small-pox reported from Jamalpore.
	Jamalpore ...	0·15	
	Kishoregunge ...	0·04	
	Attea ...	0·08	
	Netrokona ...	0·60	

* For week ending 3rd instant.

No.	District, and date of return.	Rainfall at Sudder Station in inches.	Character of the weather, state and prospects of the crops, and state of health at date.
BENGAL—*concld.*			
Eastern Districts—concld.			
CHITTAGONG DIVN. 22	Chittagong, Mar. 6 '83	6·22	Heavy rain on 3rd instant, with storm damaging spring crops. Prices steady. Cow-pox still continues. A few cases of cattle-disease reported.
23	Noakholly, „ 1 „	1·41	Weather—cool again owing to rain during latter part of week. Cloudy still at times. Late rain has done much good to winter crops which now look promising. It has also rendered the fields fit for ploughing.
24	Tipperah, „ 2 „	0·42*	Weather—showery and changeful. Heavy rain this morning (2nd). State and prospects of crops good.
	Chandpore ..	0·30	
25	Chittagong Hill Tracts. Feb. 27 „	0·55	Weather—changeable. Rain on 26th February. *Jhums* nearly all cut. Sugarcane still being cut. Tobacco doing well.
	Hill Tipperah, „ 28 „	Nil	Weather—gradually getting warm. Prospects of chillies and tobacco good. No other important crop on the field. Public health good.
BEHAR.			
PATNA DIVN. 26	Patna, Mar. 3 '83	Nil	Weather—cloudy, with west wind during the day. Prospects of *rubbee* crops continue good with the exception of poppy. Pressing of sugarcane going on. Public health good.
27	Gya, „ 3 „	Nil	Weather—pleasent. Thrashing of paddy almost finished. *Rubbee* crops good. Wheat being cut. General health good.
28	Shahabad, „ 3 „	0·07	Weather—hot in the day and cloudy at intervals. Harvesting of peas nearly over, and that of early *rubbee* has commenced. Cloudy weather has slightly injured prospects of *rubbee* crops. Chicken-pox reported Sasseram town.
29	Durbhunga, „ 3 „	Nil	Weather—cloudy. *Rubbee* crops are being harvested. Prices almost stationary. Public health good.
30	Mozufferpore, „ 3 „	Nil	Weather—fine and cloudy alternately. *Rubbee* ready for reaping, and harvesting commenced in some places. Slight injury done to standing crops by late rain. Fever still reported from Seetamurhee and elsewhere; otherwise public health good.
	Seetamurhee ...	0·23	
31	Sarun, „ 3 „	Nil	Weather—cool and occasionally cloudy. Mustard and peas being harvested. Pressing of sugarcane going on. Prospects of other *rubbee* crops continue favourable. *Cheena* being grown on poppy lands. Sporadic cases of small-pox reported; general health otherwise good.
	Sewan ...	0·05	
32	Chumparun, „ 3 „	Nil	Weather—cloudy. Westerly wind blowing. Prospects of all crops, with the exception of poppy, continue favourable. Public health generally good.
BHAGULPORE DIVN. 33	Monghyr, Mar. 3 '83	Nil	Weather—dull and cloudy. In Beguserai sub-division prospects of *rubbee* continue good; in Jamui they are not favourable; in Sudder sub-division recent rain has slightly damaged the crops; but on the whole prospects favourable. Public health good.
34	Bhagulpore, „ 3 „	Nil	Weather—cloudy and unsettled. Warm in day, but still cold at night. Prospects good. *Rubbee* harvest has commenced in places. Lands are being prepared for early sowings of paddy.
35	Purneah, „ 3 „	0·02	Weather—cloudy, with cold westerly wind for last three days. Prospects of crops good. Health good.
36	Maldah, „ 3 „	0·11	Weather—clear and cool and occasionally cloudy. Cold season is being pleasantly protracted. Mornings and evenings still continue very cool, but heat in the day is steadily increasing. Prospects of standing crops fair. Prices of food-grains stationary. The rain has injured the mango-blossoms, but prospects of the mango-season still continue fair. Public health good.
37	Sonthal Perghs. „ 3 „	Nil	A slight rainfall brought another return of cold weather. *Rubbee* crops doing well. Public health good.
	Deoghur ...	0·34	
ORISSA.			
ORISSA DIVN. 38	Cuttack, Mar. 2 '83	0·18	Weather—hot, but sometimes cloudy. *Sarad* rice being thrashed. *Dalua* rice and wheat promising. Sugarcane being pressed. Price of rice unchanged. Public health generally good. Cholera reported to have appeared in some places of the Kendrapara sub-division.
39	Pooree, „ 1 „	0·19	Weather—hot and cloudy. Miscellaneous crops doing well. Ploughing going on. Common rice selling at from 30 to 39 Calcutta seers per rupee. Cholera still reported.
	Khoorda ...	0·40	
40	Balasore, „ 2 „	4·37	Weather—cloudy and damp. *Rubbee* crops still being reaped. Sugarcane being cultivated. Small-pox and cholera reported at places.
CHOTA NAGPORE.			
South-West Frontier Agency.			
41	Hazaribagh, Mar. 2 '83	Nil	Weather—seasonable. Wheat, barley and other crops are being cut in places. Fever and small-pox cases still prevalent in certain thanas. General health good.
42	Lohardugga, „ 3 „	0·10	Weather—cloudy towards the end of week. More rain wanted for springs ploughing. *Rubbee* harvest progressing; outturn good. Prices stationary. Public health fair, but cattle-disease still increasing in Palamow.
43	Singbhoom, „ 2 „	0·10	Weather—cloudy and hot. Cold-weather crops doing well. Small-pox continue in the district, but has much decreased.
44	Manbhoom, „ 3 „	0·17	Weather—getting gradually warmer. Sugarcane-pressing continues. Wheat and other dry-weather crops getting on well. Mango and *mohwa* trees blossoming. Small-pox reported from Roghunathpore and Baghmoondee chicken-pox and cattle-disease from Purulia.
	Govindpore ...	0·06	

* For week ending 1st instant.

Published for general information.

CALCUTTA, STATISTICAL DEPT.,
The 6th March 1883.

COLMAN MACAULAY,
Secy. to the Govt. of Bengal.

STATEMENT SHOWING THE STOCK OF RICE IN AND AROUND CALCUTTA.

Names of Marts.	Stock in hand as compiled on—												
	1st week of Mar. 1882.	1st week of April 1882.	1st week of May 1882.	1st week of June 1882.	1st week of July 1882.	1st week of August 1882.	1st week of Sept. 1882.	1st week of Oct. 1882.	1st week of Nov. 1882.	1st week of Dec. 1882.	1st week of Jan. 1883.	1st week of Feb. 1883.	1st week of March 1883.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Baliaghatta	5,66,000	6,54,000	5,51,000	4,29,000	3,80,500	3,94,000	4,17,500	4,21,000	2,69,000	2,50,600	3,85,300	5,50,500	7,40,000
Ooltadanga	72,800	75,100	71,700	69,800	65,500	71,700	76,700	63,300	65,500	47,600	57,100	48,200	89,900
Chitpore, Golabaree, Coomertooly, Hatkhola, and Culpy Ghât.	6,83,100	7,62,900	7,26,300	7,11,400	6,89,700	7,03,800	7,24,700	7,05,500	6,49,600	6,95,200	6,62,050	6,11,400	7,22,200
Pathuriaghatta, Posta, and Jorabagan.	24,500	32,000	23,500	17,500	16,500	21,500	22,500	28,000	10,500	16,500	21,700	13,200	19,500
Tollygunge, Chitlah, Kidderpore, and Moonshigunge.	1,86,000	1,56,950	1,14,700	1,28,900	1,06,700	1,39,800	1,56,200	1,36,200	1,06,200	1,04,800	1,17,800	1,00,000	1,11,600
21 Minor Bazars (estimated) ...	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000
Other retail shops, 3,129 in number (estimated).	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000	2,50,000
Boidyabatty, Nowabgunge, Bhuddressur, and Chandernagore.	9,062	8,150	17,568	20,731	18,919	21,125	15,875	20,531	17,181	9,750	7,994	6,012	6,975
Total ...	20,31,462	21,79,100	19,94,768	18,67,331	17,67,819	18,41,925	19,03,475	18,64,531	16,07,981	16,14,450	17,41,944	18,19,312	21,80,175
On Railway premises on both sides of the river.	7,146 (on 3rd Mar. 82.)	4,444 (on 4th April 82.)	8,284 (on 4th May 82.)	2,860 (on 3rd June 82.)	4,866 (on 3rd July 82.)	2,790 (on 5th Aug. 82.)	5,222 (on 2nd Sept. 82.)	740 (on 5th Oct. 82.)	5,402 (on 4th Nov. 82.)	4,408 (on 2nd Dec. 82.)	5,672 (on 3rd Jan. 83.)	780 (on 3rd Feb. 83.)	876 (on 3rd March 83.)
On boats unloaded ... By Port Commissioners' returns.	45,838 (1st to 3rd Mar. 82.)	34,100 (2nd to 4th April 82.)	23,968 (1st to 3rd May 82.)	19,201 (1st to 3rd June 82.)	24,938 (1st to 3rd July 82.)	77,377 (3rd to 5th August 82.)	56,963 (1st to 3rd Sept. 1882.)	35,252 (2nd to 4th Oct. 82.)	22,399 (1st to 3rd Nov. 82.)	37,123 (1st to 3rd Dec. 82.)	36,600 (1st to 3rd Jan. 83.)	21,292 (1st to 3rd Feb. 83.)	69,114 (1st to 3rd March 83.)
On boats unloaded ... By Canal returns	1,37,862 (1st to 3rd Mar. 82.)	48,377 (2nd to 4th April 82.)	36,185 (1st to 3rd May 82.)	40,349 (1st to 3rd June 82.)	49,073 (1st to 3rd July 82.)	54,181 (3rd to 5th August 82.)	60,790 (1st to 3rd Sept. 1882.)	39,692 (2nd to 4th Oct. 82.)	24,085 (1st to 3rd Nov. 82.)	18,887 (1st to 3rd Dec. 82.)	1,22,775 (1st to 3rd Jan. 83.)	1,15,534 (1st to 3rd Feb. 83.)	82,019 (1st to 3rd March 83.)
Grand Total of Stocks ...	22,22,308	22,66,021	20,63,205	19,29,741	18,46,696	19,76,273	20,26,450	19,40,215	16,59,867	16,74,868	19,06,991	19,56,918	23,35,184
Probable stock available for exportation by sea.	11½ lakhs.	12 lakhs.	10 lakhs.	8¼ lakhs.	8 lakhs.	9¼ lakhs.	9¾ lakhs.	9 lakhs.	6 lakhs.	6¼ lakhs.	8½ lakhs.	9 lakhs.	12¾ lakhs

STATISTICAL DEPARTMENT,
The 5th March 1883.

COLMAN MACAULAY,
Secy. to the Govt. of Bengal.

PRICES CURRENT of Food-grains, Firewood, and Salt in the

RETAIL SALE:—QUANTITIES PER RUPEE IN

	DISTRICTS.	Wheat.			Barley.			Rice, best sort			Rice, common.			Bulrush Millet—Cumboo, Bajra.			Great Millet—Cholum, Jowar.		
		Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.
	BENGAL.																		
	Western Districts.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.	S. Ch.
1	Burdwan ...	A 18 0	18 0	12 0	30 0	40 0	60 0	20 8	26 0	29 0	23 12	27 12	32 8	...	.		...	...	...
2	Bankoora ...	B 13 8	14 8	13 0	16 0	16 8	18 0	20 0	20 0	25 0	26 8	27 0	33 0	..	...	..	..	...	...
3	Beerbhoom ...	C 13 12	13 12	12 0	...	...	...	16 8	20 0	24 0	22 8	24 0	30 0	...	...	..	..	...	...
4	Midnapore ...	D 13 0	13 0	14 8	16 0	16 0	...	21 0	22 0	20 0	28 0	28 0	28 0	...	...	..	...	...	...
5	Hooghly ...	E 15 8	15 8	15 0	...	...	...	10 0	10 0	10 0	19 0	19 0	20 0	...	...	..	...	...	...
	Howrah ...	13 4	12 8	13 8	...	...	...	16 0	16 0	18 0	22 0	20 0	25 0	...	...	..	...	...	...
	Central Districts.																		
	Calcutta ...	14 0	13 5	14 0	20 0	23 2	29 0	10 12	10 0	10 0	16 0	16 0	17 12	17 0	17 0	...	24 8	26 10	30 4
6	24-Pergunnahs ..	F 13 0	13 5	11 4	20 0	20 0	26 0	8 0	8 0	10 0	17 12	17 8	20 0	13 0	...	...	21 12	20 0	26 0
7	Nuddea ...	G 16 0	16 0	16 0	...	...	32 0	17 4	18 8½	22 15	18 12	20 0	24 10	...	...	..	...	...	...
8	Khoolna ..	H ...	...	...	...	...	...	19 0	18 0	...	26 0	25 0	...	...	...	...	...	...	...
9	Jessore ...	I 13 0	13 0	14 0	..	...	...	20 0	20 0	21 4	25 8	24 8	28 0	...		..	...	...	...
10	Moorshedabad...	J 16 0	16 0	14 0	...	...	...	16 0	17 0	20 0	23 8	23 8	32 0	...	...	..	...	...	...
11	Dinagepore ..	K 13 2	13 2	14 0	14 0	14 0	24 0	20 4	20 4	25 9	24 0	24 0	32 0	...	...	..	...	...	...
12	Rajshahye ...	L 17 4	16 8	13 8 to 16 0	37 8	32 0	48 12	16 8 to 19 4	18 12 to 18 12	12 8 to 14 0	20 4 to 21 0	21 0 to 22 0	37 3 to 30 0	...	...	..		..	..
13	Rungpore ...	M 16 0	16 0	12 0	...	...	...	13 5	13 5	15 0	20 0	20 0	25 14		...	..	...	...	...
14	Bogra ...	13 8	12 0	20 4	..	...	...	15 12	2 0	18 12	28 2	30 0	33 12		...	...	...	..	...
15	Pubna ...	N 16 8	15 0	22 8	...	...	...	10 0	10 0	12 0	24 0	24 0	28 8	...	...	..	...	...	...
16	Darjeeling* ...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	..	...	...	...
17	Julpigoree ...	O 11 8	11 8	9 0	20 0	20 0	20 0	15 0	15 0	16 0	20 0	20 0	23 0	...	...		...	...	...
	Eastern Districts.																		
18	Dacca ...	P 14 8	16 0	14 8	27 8	27 8	53 4	20 8	21 8	26 12	25 0	27 8	32 0	...	..	...	...	...	...
19	Furreedpore ...	Q 20 0	20 0	19 0	35 0	35 0	30 0	23 0	24 0	20 0	24 0	25 0	26 0	...	...	..	...	...	...
20	Backergunge ..	R ...	...	...	...	...	...	19 0	19 0	23 0	25 0	27 0	29 0	...	...	..	...	...	...
21	Mymensingh ...	S 13 0	13 0	10 0	...	...	...	20 0	20 0	20 0	25 0	27 0	29 0	...	...	..	...	...	...

* Return not received.

A In the sub-divisions retail prices of salt are as follow:—Cutwa 13 1/16 seers, Culna 15 seers, and Raneegunge 12¾ seers.

B Retail price of salt at Mejia, Bisheopore, Indas, Sonamukhi, and Kotulpore 13 seers, at Raipore 11 seers, and at Onda 16 seers.

C In the interior retail prices of salt range from 12 to 16 seers.

D In Ghattal retail price of salt is 14¾ seers.

E In the sub divisions retail prices of salt are as follow:—Serampore 13 seers and Jehanabad 13½ seers.

F In the sub-divisions retail prices of salt are as follow:—Baraset 13 seers, Diamond Harbour 10½ seers, Barrackpore 12¾ seers, and Dum-Dum 12 seers.

G In the sub-divisions retail prices of salt are as follow:—Kooshtea 13 seers, Meherpore 10½ seers, Chooadanga 12 seers, and Ranaghat 11½ seers.

H In the sub-divisions retail prices of salt are as follow:—Bagirhat 11 seers and Satkhira 12 seers.

I In Jhenidah, Magoorah and Narail sub-divisions retail price of salt is 12 seers.